A

Logic of Facts:

OR

Every-day Reasoning.

BY G. J. HOLYOAKE.

"Call him wise whose thoughts and words are a clear *because* to a clear *why*."—LAVATER.

[FOURTH THOUSAND.]

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INTRODUCTION OF 1848.

THE Logic of the Schools, however indispensable in its place, fails to meet half the common want in daily life. The Logic of the Schools begins with the *management* of the premises of an argument; there is, however, a more practical lesson to be learned in beginning with the *premises* themselves. A thousand errors arise through the assumption of premises for one arising in the misplacement of terms. The Logic of the Schools is an elaborate attack upon the lesser evil.

Sir James Mackintosh has remarked that 'Popular reason can alone correct popular sophistry'—and it is in vain that we expect amendment in the reasoning of the multitude, unless we make reasoning intelligible to the multitude. As to my object, could I, like Gridiron-Cobbett, adopt a symbol of it, I would have engraved Æsop's 'Old Man and his Ass,' who, in a vain attempt to please everybody, failed (like his disciples—for even *he* has disciples) to please anybody. The folly of that superfluously philanthropic old gentleman should teach us *proportion* of purpose. To be of real service to *some* is in the compass of individual capacity, and, consequently, the true way of serving, if not of pleasing *all*. The republic of literature, like society, has its aristocratic, its middle, and its lower classes. No one has combined, in one performance, the refinement applauded in the universities, with the practical purpose, popular among those who toil to live, and live to toil. The populace are my choice—of them I am one, and, like a recent premier, Earl Grey, am disposed 'to stand by my order.' I write for this class both from

affection and taste. If I can benefit any, I can them. I know their difficulties, for I have encountered them—their wants, for they have been mine. This will account for the liberties taken with the subjects upon which I treat. There is more than one kind of hunger that will break through barriers, and I have taken with an unlicensed hand, wherever it was to be found, what I wanted for myself, and what I know to be wanted by those who stand at the anvil and the loom, and who never had the benefits of scholastic education, and who never will.

Many of the arts and sciences, which formerly resided exclusively in the colleges, and ministered only to the sons of opulence and leisure, have escaped from their retreat, and have become the hand-maids of the populace. But as respects logic, there still remains between the learned and the illiterate an impassable gulf. The uninformed look on the recondite structure of logic, and they are repelled by the difficulty of comprehending it, and wrap themselves up in absolute and obstinate ignorance, which they believe to be their destiny. The populace, in our manufactories, have to choose between subsistence and intelligence. For study, after protracted toil, they have not the strength—and to abridge their labour is to abridge their subsistence, and this they cannot afford. But because they are precluded by the destiny of civilisation from knowing much, they need not remain utterly unskilled in reasoning. Their natural good sense may be systematised, their natural logic may be reduced to some rule and order—though it may not be refined it may be practical, it may give power, and develop capacity now dormant.

The hints, general rules, and elementary remarks dispersed throughout this work, will probably be of service to the uninitiated, perhaps put them on the road to higher acquirements, give them a confidence in their own powers, perhaps inspire them with a love of these essential studies, and impart a taste for the refinements which lie beyond. My hope is that many will be induced to consult scholastic treatises, and acquire that accurate knowledge which makes the society of educated people so interesting. Impulse has been given to knowledge, and the populace have begun to think, and both to speak and write their thinkings—and why should they not be enabled to do it free from obvious mis-

takes, and with a broad propriety commensurate with the native capacity they possess? Why should they, like a certain learned politician on a public occasion, propose, as a sentiment, 'The three R's, Reading, 'Riting, and 'Rithmetic?'* Why, in writing, should they not express themselves with strong grammatical coherence, and a certain bold perspicuity, if not able to reach refinement and elegance? Why, in pronunciation, should they not speak with a certain manly openness of vowel sound and a distinct articulation, if not with all elocutionary modulation? Why should not their discourse be expressed in brief, clear sentences? If their punctuation went no farther than placing capital letters at the commencement of sentences and of proper names, and periods at the conclusion of sentences, it would render their writings more intelligible than are half the communications they now send to the press. If they mastered only brevity and abrupt directness, and learned to omit tedious prolixity, they would command a hearing in many cases where now they are denied one. If in logic they made a shrewd mastery of plain facts—being as sure as they could, when once set on surety, eschewing conjecture and pernicious supposition—if they followed the methods of nature and good sense, where the elaborate methods of art are hidden from them, who will not admit that they would be more intelligible than now, exercise a power they never yet possessed, and extort the attention and esteem of the public where now they excite only its pity, or contempt, or outrage what just taste it has? The people would be enabled to do these things, but that so many who prepare treatises for their guidance alarm them by the display of abstruse dissertation above their powers, their means, their time, and their wants. That a little learning is a dangerous thing is not a maxim alone believed in by the race of country squires steeped in port and prejudice, but by schoolmen who cannot bring themselves to give a little proportion of sound knowledge, but must give all, the recondite as well. The statesman decries the ignorance and want of wisdom displayed by embryo politicians who will accept

* This case is cited by S. G. Goodrich, the original Peter Parley, in his preface to 'Fireside Education.' Sir William Curtis, to whom, probably, Mr. Goodrich refers, gave also 'the three K's—King, Church, and Constitution.'

no instalment of liberty, but insist on the concession of *all* their claims—but the scholar does the same thing when he will impart none but the completest information to the people.

In quoting, I have been a borrower, but not a plagiarist. In no case am I conscious of having taken from others without at the same time making the fairest acknowledgment in my power.

If the references to the highest authorities are sometimes through others, it is because the highest authorities have not always been accessible. Those who have had ordinary experience estimate highly the value of minute integrity in this respect. Fruitless hours are spent in tracing false and careless references, and to one whose time is his means, no little injury is done when it is thus wasted.

Unbounded gratitude is due to those authors, old and new, who, with learning and grace, with care and patience, have put the world in possession of thoughts which are real additions to its knowledge—and corresponding should be the contempt of those whose high-sounding and pretending books seduce readers to wade through them only to find in them the millioneth echo of some commonplace idea.

The 'Spectator' was pleased to say that I wrote "Practical Grammar' in the spirit of an 'ultra-radical, setting the world to rights.' Yet I have always declared, with Butler—

> Reforming schemes are none of mine,
> To mend the *world's* a vast design;
> Like those who toil in little boat
> To drag to them the ship afloat.

Utopianism is not my idiosyncracy. But I have confidence in endeavour. Continuity of ameliorative effort is the sole enthusiasm that can serve the cause of improvement. It is useful to do what seems to be useful, whether little or much—a moderate rule, but one that will take those who carry it out, a long way.

My illustrations, I need scarcely say, are neutral in politics and theology. In the grammar of J. A. D. D'Orsey, published in 'Chambers' Educational Course,' there are disputations, Biblicisms, and bits of intense theology. Professor John Radford Young, in his treatise on Algebra, has introduced a reply to Hume's controverted theory of miracles—

and Dr. Whately makes his 'Logic' an avowedly theological auxiliary, showing that much passes for good taste in this country which is only an irrelevant propitiation of powerful opinion. I have not, however, been seduced by this species of example. There are distinct provinces in intellect as well as in industry—and what political economy justifies in one case, good sense dictates in the other. No man has a right to intrude theology into every question, and agitate points of faith when he pretends to instruct the understanding.

There is less occasion to speak of the utility of logic, than to show it to be easy of acquisition. Mr. Stuart Mill, in confirmation of this view, observes: We need not seek far for a solution of the question so often agitated, respecting the utility of Logic. If a science of logic exists, or is capable of existing, it must be useful. If there be rules to which every mind conforms, in every instance in which it judges rightly, there seems little necessity for discussing whether a person is more likely to observe those rules when he knows the rules, than when he is unacquainted with them.* Certainly people are not so much prejudiced against logic on account of its supposed uselessness as on account of its supposed difficulties. Deserved or not, logic has always had a good reputation. Well or ill founded, the popular impression has uniformly been in its favour. It has been valued like the diamond—but considered, like that precious stone, of very uncertain access.

The high popularity of common sense—'the exercise of the judgment unaided by rule'—has been interpreted into a virtual rejection of logic by the multitude. But it ought not to be overlooked, that the credit in which mere common sense is held, is a matter of necessity as well as choice. It being the best sense the untutored have, they wisely use it, and no wonder that they are inclined to laud what they are constrained to employ. Doubtless they always perceived that common sense would be the better for being made orderly, as a spirited horse is the fitter for use after being 'broken.' Logical sense, among the masses, is secretly supposed to be disciplined sense, and to have all the advantage of the trained soldier over the raw recruit.

It is quite true, as Abram Tucker puts it, that 'The science

* 'System of Logic,' p. 12. Second Edition.

of abstruse learning, when completely attained, is like Achilles' spear, that healed the wounds it had made before; so this knowledge serves to repair the damage itself had occasioned, it casts no additional light upon the paths of life.' But few persons sensible of the value of exact knowledge will complain of the *necessary* elaboration to which it sometimes leads. Nor will those who have felt the thrill of pleasure which complete analysis imparts, regret the patience which put them in possession of a secret of science, or made them master of a new field of knowledge.

Common sense is the substratum of all logic. Common sense is the natural sense of mankind. It is founded on common observation and experience. It is modest and plain and unsophisticated. It sees with everybody's eyes and hears with everybody's ears. It has no capricious distinctions, no partialities, and no mysteries. It never equivocates and never trifles. Its language is always the same, and is always intelligible. It is known by its perspicuity of speech and singleness of purpose. The most prudent of all the children of fact, it never forsakes nature or reason. Some outline laws for its employment, if they can be indicated, must be better than its popular aimless and desultory use.

PREFACE OF 1866.

One has no right to make a literary subject political —that is, to make it partisan; but to give a political motive which concerns all equally, for promoting a literary study, is allowable, and does not partake of the nature of party politics. One may, like Cobbett, look on literature with political eyes, without, like him, making it a vehicle of party attacks.

In this country, where the political genius of the people lies in self-government — where the public growth of the people and their internal liberty depend upon their capacity to manage their own affairs—the art of public speaking has political importance to every side in politics.

To be able to take a subject well in hand, like a stage-coach driver does his horses—to hold the reins of your arguments firmly—to direct and drive well home the burden of your meaning, is a power which every man ought to study to attain, who rises to address a council, or stands up on a platform to convince a meeting.

A LOGIC OF FACTS.

CHAP. I.

THE LOGIC OF THE SCHOOLS.

It is a humiliating reflection that mankind never reasoned so ill as when they most professed to cultivate the art of reasoning.—*Life of Galileo*, p. 1. Society for the Diffusion of Useful Knowledge.

Common sense—the foundation of logic—first received (to a limited extent) the regularity of an art and the certainty of a science, from the master hand of Aristotle. Impartial scholars, familiar with his writings on logic, allow them to have not only ingenuity but real merit; and his admirers contend that he has been misunderstood by some and abused by others. This is highly probable, as we are certain that when his works were interpreted by the schools, and his logic proclaimed the great text-book of knowledge and the only weapon of truth, 'men's minds, instead of studying nature, were in an endless ferment about occult qualities and imaginary essences; little was talked of but intention and remission, proportion and degree, infinity, formality, quiddity and individuality.'* Logic then was jargon, controversy chicane, and truth a shuttlecock, with which the disputants respectively played, or the object which they mutually disguised. Logic was a labyrinth in which the subtlest lost their way—a bourne from which the traveller after truth seldom returned.

A striking illustration of this has been furnished by a candid and distinguished writer—Dr. Reid. 'Of the analytics and of the topics of Aristotle, ingenuousness requires me to confess, that though I have often purposed to read the whole with care, and to under-

* Account of Lord Bacon's Novum Organon Scientiarum, Lib. of Useful Knowledge, p. 4.

stand *what is intelligible*, yet my courage and patience always failed me before I had done. Why should I throw away so much time and painful attention upon a thing of so little real use? If I had lived in those ages when the knowledge of Aristotle's Organon entitled a man to the highest rank in philosophy, ambition might have induced me to employ upon it some years of painful study; and, less, I conceive, would not be sufficient. Such reflections as these always got the better of my resolution.'*

Dr. Whately, who has for many years occupied the throne of Logic and whose work may be taken, from its currency in our colleges and academies, as the representative of the logic of the schools, seems to obviate all objections to the abstruseness of this subject by a counter charge, to the effect that logic is now underrated only because it has been overrated. But it is not the complexity found in it, but the laudations bestowed upon it which have brought it into neglect. Dr. Whately contends that certain writers, 'by representing logic as furnishing the sole instrument for the discovery of truth in all subjects, and as teaching the use of the intellectual faculties in general, raised expectations which could not be realised, and which naturally led to a reaction—to logic being regarded as utterly futile and empty.'† Deeply deploring this kind of injury, from which many important arts have suffered, I am neither disposed to defend such a course, nor to imitate it. But I demur to the truth of this representation with regard to logic. If logic be not the 'sole instrument for the discovery of truth in all subjects,' it is certainly the *principal* one. Instead of charging scholastic logicians with having unduly 'raised,' it would be nearer the truth, in my opinion, to say that they have *confused* 'expectations' by intricate machinery and extreme elaborations.

Intricacy and minuteness of detail might be a trifling disqualification did they lead to something immediately practical. But Dr. Whately contends that logic, in the most extensive sense which the name can, with propriety, be made to bear, is that of the science, and also the art of reasoning. 'Inasmuch as logic institutes an analysis of the process of the mind in reasoning, it is strictly a *science*, while considered in reference to the practical

* Lord Kames's Sketches, vol. 3, chap. 3. Aristotle's Logic.
† Dr. Whately: Elements of Logic, preface, p. vii. Second edition.

rules it furnishes it is an *art*.'* He confines the province of logic, as an art, to 'employing language properly for the purpose of reasoning,'† and restricts the logician to the use of the syllogism as the sole test of argument. Mr. Augustus de Morgan thus exhibits the spirit of Whately's restriction:—

Logic has nothing to do with the truth of the facts, opinions, or presumptions, from which an inference is derived; but simply takes care that the inference shall certainly be true if the premises be true.'

It has been, and *is* to be, objected, that logic, thus confined, 'leaves untouched the greatest difficulties, and those which are the sources of the greatest errors in reasoning.' To this powerful objection Dr. Whately thinks it sufficient to reply, that 'no art is to be censured for not teaching more than falls within its province, and, indeed, more than can be taught by any conceivable art. Such a system of universal knowledge as should instruct us in the full meaning or meanings of every term, and the truth or falsity, certainty or uncertainty of every proposition, thus superseding all other studies, it is most unphilosophical to expect, or even to imagine. And to find fault with logic for not performing this, is as if one should object to optics for not giving sight to the blind—or complain of a reading glass for being of no service to a person who had never learnt to read.'‡ This would be a most conclusive answer if confident assertion could be accepted in lieu of proof. The objection still remains to be removed. We may still demand, does it not fall within the legitimate province of logic to provide means of encountering the 'greatest difficulties' with which it is confessed logic is beset? True, there is no art can teach everything, but is that a reason why logic should teach nothing, or next to nothing, compared with what seems essentially necessary?

Dr. Whately contends that the 'difficulties' and 'errors' in the objection adduced, 'are in the *subject matter* about which logic is employed, and *not* in the process of reasoning—which alone is the appropriate province of logic. But it seems to me that Dr. Whately has found it impossible to keep within the bounds of the restriction he thus endeavours to establish.

* Intro., p. 1.
† Elem. of Logic, Synthetical Compendium, chap. 2, part 1, sec. 2.
‡ Elem. of Logic, Intro., pp. 12, 13.

In treating upon 'apprehension,' he introduces, as indeed he was obliged to do, from the department of metaphysics, several speculations on 'generalisation' and 'abstractions,' and from ontology (the science which explains the most general conceptions respecting the phenomena of nature) he borrows the leading principles of definition. Because he thus goes so far, it is not to be contended that *therefore* he should have gone further; but when he found he must depart from his rule and borrow from other branches of knowledge (no matter for what end), why did he not depart from it to some purpose, and borrow from natural philosophy such rules as would have guarded the logician from the 'chief errors' into which he may fall?

Dr. Whately informs us, indeed, that logic furnishes certain syllogistic forms to which all sound arguments may be reduced, and thus establishes universal tests for the detection of fallacy—but it is to be observed that it is only *such* fallacy as may creep in *between* the premises and the conclusion of an argument. It is to this narrow and Aristotelian object that logic is restricted. 'The process of reasoning itself is alone the appropriate province of logic. This process will have been correctly conducted if it have conformed to the logical rules, which preclude the possibility of any error creeping in *between* the principles from which we are arguing, and the conclusions we deduce from them.'* We learn from our authority, that as arithmetic does not profess to introduce any notice of the *things*, whether coins, persons, or dimensions, respecting which calculations are made; neither does logic undertake 'the ascertainment of facts, or the degree of evidence of doubtful propositions.' And just as an arithmetical result will be useless if the data of the calculation be incorrect, so a logical conclusion is liable to be false if the premises are so. Neither does the logic, now under consideration, concern itself with the 'discovery of truth,' excepting so far as that may be said to be implied by the detection of error in a false inference.† Logic thus confined to the actual process of reasoning, however important its functions there, evidently leaves us in the dark as to the value of what we reason about. For the information thus missing, this logic refers us to knowledge

* Intro., p. 13.

† For the grounds of these representations, see Dissertation on the Province of Reasoning, chap. 2, sec. 4 Dr. Whately's Logic.

in general — to grammar and composition for the art of expressing, with correctness and perspicuity, the terms of propositions—to natural, moral, political, or other philosophy, for the facts which alone can establish the truth of the premises reasoned from.

The exclusion from logic of all consideration of the facts on which propositions are founded, is thus endeavoured to be justified by the Archbishop of Dublin:—'No arithmetical skill will secure a correct result, unless the data are correct from which we calculate: nor does any one on that account undervalue arithmetic; and yet the objection against logic rests on no better foundation.' This is true, but is it true that arithmetic is on *this account* to be imitated? If the arithmetician must take his data for granted, it is what the searcher after truth must never do—*he* must use his eyes and examine for himself, in all cases, as far as possible, unless he intends to be deceived. And for want of such precaution as this, the arithmetician is at sea the moment he steps out of the narrow path of mechanical routine. Who is not aware of the failures of calculation when applied to the general business of life—to statistics, moral and political? Every day, facts have to be called in to correct the egregious blunders of figures.* The calculations are conducted in most approved form, but are of no use. Does not this demonstrate that when arithmetic, like logic, is applied to the business of life, general rules for securing the accuracy of data would be of essential service? Supposing, however, that arithmetic could do very well without them, does it follow that logic should, when it would be safer and more efficient with them?

Since our author's canons are held absolute in the schools, it may be useful to consider this last cited argument in another light. A stronger objection may be urged, one which particularly addresses itself to those who mistake mere pertinence for genetal relevance, and suppose that a single analogy decides a case.

* 'In Art, in Practice, innumerable critics will demonstrate that most things are impossible. It was proved by fluxionary calculus, that steam-ships could never get across from the farthest point of Ireland to the nearest of Newfoundland; impelling force, resisting force, maximum here, minimum there; by law of Nature, and geometric demonstration—what could be done? The Great Western could weigh anchor from Bristol Port; that could be done. The Great Western, bounding safe through the gullets of the Hudson, threw her cable out on the capstan of New York, and left our still moist paper-demonstration to dry itself at leisure.'—*Thomas Carlyle*, Chartism, pp. 96-7.

His Grace reasons, that, because arithmetic does not concern itself about its data, logic should follow the same example. But why overlooks he pure mathematics—a much higher science than arithmetic? Surely geometry, which through all time has been the model of the sciences, was better worthy than arithmetic to be the model of logic! Was it classical in the principal of St. Alban's College to abandon Euclid and cleave unto Cocker or Walkingame?

Arithmetic is mechanical—geometry is reasoning; surely it was more befitting to compare reason with reason, when endeavouring to discover the true way of perfecting reason. Geometry is, of all sciences, reputed the most conclusive in its arguments—and we know it is distinguished above all sciences for carefulness in its data. It begins with axioms, the most indubitable of all data, and its subsequent conclusions are founded only on established facts—and to be sure that they are established facts, the geometer, before he employs them, establishes them himself. If an analogy is to decide the province of logic, here is an analogy whose pretensions over those of arithmetic are eminent.

So conclusive did Dr. Whately deem the argument just examined, that he many times, in various forms, reproduced it. One of the last instances is under the head of 'Fallacies.' 'It has been made a subject of bitter complaint against logic, that it presupposes the most difficult point to be already accomplished; viz., the sense of the terms to be ascertained. A similar objection might be urged against every other art in existence *e. g.*, against agriculture, that all the precepts for the cultivation of land presuppose the possession of a farm.'* Already has been pointed out what may reasonably induce a suspicion of the soundness of these analogies; viz., that their author found it necessary to disregard them and introduce, from other branches of knowledge, certain disquisitions on the 'sense of terms.' With regard to this particular instance, it may be observed, that though treatises on agriculture do presuppose the possession of a farm, they do not presuppose the knowledge requisite for cultivating it, but inform us *fully* of soil, and seed, and crops. So logic may be allowed to presuppose the existence of the universe, whence truth is drawn, or the existence

* Logic, chap. 3. Fallacies, sec. 2.

of language, whereby it is expressed; but it is surely not to *presuppose* the knowledge of facts and terms, the great instruments for the cultivation of truth. Agricultural treatises hardly warrant this inference. These are the representations that induced the confession that 'Logic is not so much an instrument of acquirement as of defence. It is a good armour to buckle on when compelled to battle for our heritage, but a poor implement for its cultivation.'*

All *practical* arts include a knowledge of materials as well as implements. Platers, ignorant of the nature of metals, cabinet-makers, of the different species of wood, make but sorry artizans; and in like manner, reasoners, unacquainted, at least in a general way, with the accuracy of what is reasoned about, make but sorry logicians.†

It will readily be expected that in the modern progress of knowledge, the Aristotelian province of logic would be enlarged. The far-seeing intellect of Lord Verulam heralded the innovation—'Our glorious Bacon led philosophy forth from the jargon of schools and the fopperies of sects. He made her to be—the handmaid of nature, friendly to her creatures, and faithful to her laws.'‡

The general object of Lord Bacon's philosophy, writes Bruce, an Edinburgh professor of logic of the last century, is to connect the reasoning powers of man with experiments for the improvement of natural knowledge.

To create a just taste for philosophical investigation, required—1. A display of the true, that they may be distinguished from the false subjects of inquiry. 2. Scientific rules to direct the discovery of the laws of nature.

But to 'display the true,' is to display the *facts* on which the truth rests. The 'discovery of the laws of nature' implies *observation* of the operations of nature. The philosophy of Bacon, says Macaulay, began in observation and ended in arts.

* W. J. Fox, Mon. Rep., p. 45: 1835.

† The reader will find that logician is used in the sense of skilfulness in eliciting and exhibiting reality. By that which I call logical is meant that which is truthful. I presume that is the sense to which this high word should be confined. It is the lax application of this term to mere dexterity in evading the truth according to rule, that has so increased the unsatisfactory race of professed sceptics.—See *Scepticism*, chap. XII.

‡ Langhornes' Preface to the Lives of Plutarch.

It is most obvious, as the reader will gather from what has been advanced, that for guarding, to the greatest possible extent, against error in conclusions, it is necessary to take into consideration the character of the data from which we reason—and to do this, we must draw from the general sources of knowledge to which the Logic of the Schools refers us. If we happen not to possess an accurate acquaintance with these branches, we must draw upon the best notions we have of them, or apply such natural sagacity as we happen to possess. But whether the information we happen to possess be complete or partial, it is not well that we are left to apply it at random, without any definite mode of procedure; and if logic refuses to assist us, and gives only a vague reference elsewhere, we must endeavour to assist ourselves. The datum of all arguments is a proposition, an assertion, or denial; and to ascertain its truth (upon which the value of the whole reasoning depends) we have to do with the facts upon which it rests, and the terms in which it is expressed. For it may be here observed, that the truth or falsity of every proposition depends upon facts. To ascertain the general accuracy of facts, we have to appeal to received standards of certainty; and to fix the meaning of terms, we have recourse to a plain principle of definition. In the task of recognising truth, so necessary in examining the premises of an argument, one is wonderfully assisted by being familiarised with the sources of truth, and the mode of its discovery. In these operations the tutored and untutored may alike be assisted by simple general rules. If these rules prove not infallible in every case, they will prove successful in the majority of cases.

Since general rules are the only rules that the vast field of facts admits of, they are not to be rejected on light grounds. They enable us to set forth intelligibly the reasons of our own conviction, and to detect and expose the fundamental fallacies of apparent arguments. Since they direct us where the Logic of the Schools leaves us without a guide, their value is apparent.

The logical management of the syllogism involves much abstruseness respecting 'genus' and 'species,' the 'quantity' and 'quality' of propositions, 'contraries,' 'sub-contraries,' 'contradictions,' and 'subalterns.' Stepping by 'illative conversion,' 'six rules to be observed with respect to categorical syllogism' next demand attention, followed hard by eleven moods which can

be used in a legitimate syllogism, viz.—'A, A, A, A, A, I, A, E, E, A, E, O, A, I, I, A, O, O, E, A, E, E, A, O, E, I, O, I, A, I, O, A, O.' In the middle of this abstract train march the 'undistributed middle' and the 'illicit process,' attended by four figures represented by the following 'mnemonic lines, which must be carefully committed to memory:'—

Fig. 1. bArbArA, cElArEnt, dArII, fErIOque prioris.

Fig. 2. cEsArE, cAmEstrEs, fEstInO, bArOkO,* secundæ.

Fig. 3. { tertia, dArAptI, dIsAmIs, dAtIsI, fElAptOn, bOkArdO,† fErIsO, habet; quarta insuper addit.

Fig. 4. brAmAntIp, cAmEnEs, dImArIs, fEsApo, frEsIsOn.

A motley group, too numerous to be particularised, bring up the complex rear of 'Modals,' 'Hypotheticals,' 'Conditionals,' and 'Disjunctives.' This is certainly not the portal through which the populace can at present pass to logic, even if such logic helped them to all truth, and saved them from all fallacy.

But this species of logic is not without interest. Symbolic letters and mnemonic lines are not without attractions to those who understand them. There is poetry in an algebraic sign, when it is the emblem of a difficulty solved, and a wonderful result simply arrived at. To try the whole power of words, and discover every form of language in which a legitimate deduction can be expressed, is no ignoble task. It is a high discipline, but it belongs rather to the age of leisure than this of 'copperas-fumes, cotton-fuz, gin-riot, wrath, and toil'—to the luxuries rather than the utilities of learning.

There is the inefficiency of the syllogism, and also the vitiation produced by its employment. 1. It corrupts the taste for philosophical invention by placing philosophy in abstractions, and withdrawing it from the observation of nature.

2. It creates a reliance on principles, which originate in the *hypotheses* of philosophers, not in the laws of nature.

3. It makes truth the result of the *forms* of argument, not of scientific evidence.‡

Lord Kames cites from the father of logic the following syllogism, which will bear repetition as an extraordinary instance of

* Or, Fakoro.
† Or, Dokamo.
These references to Fakoro and Dokamo are Whately's, as indeed all the particulars in this place recited, and are but a *brief* summary of the subjects comprised in his logic in reference to the syllogism.

‡ Bruce.

that assumption for which the Logic of the Schools provides no remedy:—

Heavy bodies naturally tend to the centre of the universe.

We know, by experience, that heavy bodies tend to the centre of the earth.

Therefore the centre of the earth is the centre of the universe.

But by what experience did Aristotle discover the centre of the universe, so as to become aware that heavy bodies *naturally* tend there? On what facts rest the measurement of the radii from our earth to the boundless circumference of space? How did he ascertain the limits of that which has no limits? Yet, strange to say, the Logic of the Schools prides itself in leaving us where the Stagyrite left us.

'When mankind began to reason on the phenomena of nature, they were solicitous to *abstract*, and they formed general propositions from a *limited* observation. Though these propositions were assumed, they were admitted as true. They were not examined *by appeals to nature*, but by comparison with other propositions.'*

In this syllogism from Aristotle, there is the usual compliance with accredited rules, and the same defiance of common sense. Such examples are deemed perfect reasoning and legitimate argument; but is it not a mockery to encourage the belief that we can have reason and argument, without the truth? Only this shallow consolation remains to us. If the logician of the schools does not enlighten the understanding, he is at least reputed not to offend the taste, and he wins the equivocal praise of Butler:—

> He'll run in debt by disputation,
> And pay with ratiocination;
> All this by syllogism, true
> In mood and figure, he will do.'

Syllogisms are to truth what rhyme is to poetry. 'It is a well known fact that verse, faultless in form, may be utterly destitute of poetic fire or feeling.'†

According to the Logic of the Schools, 'the question respecting the validity of an argument is not whether the conclusion be *true*, but whether it *follows* from the premises adduced.' It was

* Bruce.
† A. J. D. D'Orsey, Eng. Gram., part 2, article Prosody.

the bitter experienc of Burdon of the delusiveness of such partial logic that induced him to exclaim, '*one* fact is worth fifty *arguments*.' With such authorities, 'a valid argument is that which is so stated that its conclusiveness is evident from the mere *form* of the expression.' But since it is admitted that if the data reasoned upon be incorrect, no logical skill can secure a correct result; it is evident that however *faultless the form*, the inquirer after truth is in no way nearer his object, unless he be instructed how to lay a foundation of *faultless facts*. He then, who is in love with truth rather than logomachy, will admit, in spite of the most ingenious analogies, that there is some room for a logic of facts, as well as a logic of words.

CHAP. II.

LOCKE-LOGIC.

Logic is a general guide to the discovery of truth, and teaches us its systematic communication to others. This definition is intended to combine logic and rhetoric into one system. According to a quotation in Pinnock's Guide to Knowledge, Locke defined logic as 'that art by which we rightly use our mental faculties in the discovery and communication of truth,' a definition, called by the writer, the definition of nature echoed by genius. There exists a natural connection between logic and rhetoric. The discovery of truth could avail us little if we were without the means of communicating it; and it is easy to see that it would be in vain to possess the means of communicating truth, unless we had the truth to communicate. Therefore, ingenuity is but ill employed in separating these mutual departments of learning which nature has connected together. Besides, the skill of the logician is as serviceable in the statement of a case, as in arguing it. Arrangement is as much a matter of logic as ratiocination; and to impress this neglected truth upon the young inquirer, is one reason for proposing a combined definition.

The mutual connection of logic and rhetoric is illustrated by the fact, that the Logic of the Schools is purely a branch of

rhetoric. It consists in putting an argument into 'the most perspicuous form in which it can be exhibited,*—*i. e.*, in *communicating* it in the most efficient way to others.

Indeed, Dr. Whately (who makes logic to consist in reasoning) defines reasoning as *discourse*, and discourse is rhetoric. '*Grammar*,' says Doherty, 'represents the mechanism of letters in forming words—*Rhemar*, the mechanism of words in forming sentences. We have *Grammar* for letters, *Rhemar* for words, *Logic* for *arguments*, and *Rhetoric* for discourse.' Locke-logic, therefore —*i. e.*, logic in the sense in which Locke treated it—seems to come nearer the truth, as well as nearer the common requirement, than the restricted definition of it by others insisted on.

CHAP. III.

LOGICAL TRUTH.

All men know something of truth. Happily it is the first impulse of childhood, and nature teaches us its pleasure before reason instructs us in its truth. In infancy we own its beauty, in manhood its power. There is nothing, says Cicero, sweeter to man than the light of truth. Truth, observes Godwin, is the native element of an intellectual nature. It has been wisely remarked, said Lord Kames, that truth is to the understanding what beauty is to the eye, or music to the ear.

Philosophy sanctions what unsophisticated feelings suggested. He that has made but a little progress beyond ignorance and privilege, cannot be edified by anything but truth.† Truth, like a mathematical point, has had various descriptions; and it may be useful to select those which graduate to its logical definition. Bulwer tells us, that 'the agitation of thought is the beginning of truth.' Locke, Lord Kames, Mill, and others, agree that truth, or falsehood, is an affair of language. An assertion which represents things as they really are, is a truth—an assertion that represents things what in reality they are *not*, is a falsehood.

* Dr. Whately: Anal. Out., chap. 1, sec. 5, p. 45.
† Mr. Hobhouse: Note 15, to 4th Canto of Childe Harold.

Truth, in sculpture, means an exact similitude of some living form, chiselled in stone or marble. Truth, in painting, is a natural representation on canvass of some person, or object. In the same manner, moral 'truth is an exact image of things set forth in speech, or writing.' The logical definition of truth is given in these words:—'Truth is that which admits of proof,'* that is, an assertion or denial which can be substantiated by facts.

A fact is commonly called a truth, but this practice leads to great confusion in reasoning. A fact is only an element in truth. A logical truth is a proposition supported by facts. Facts compose the premises of an argument—a truth is the inference from the facts. Unless this distinction is observed, recourse must be had to the expedient of calling a fact a particular truth, and an induction from facts a general truth. Or we must adopt this distinction, that a moral truth, that is, the truth of parlance, is the coincidence of language with reality; and a logical truth, a proposition which admits of demonstration.

A lady, who has given intellectual laws to many whom I address, has said—'A truth I consider to be an ascertained fact, which truth would be changed into an error the moment the fact on which it rested was disproved.' But that which can be disproved cannot be an '*ascertained* fact.' Allowing, however, the relevancy of this definition of a truth, it would, in a treatise on logic, be considered as a definition only of a particular truth. Many such truths are required to make a logical truth.

CHAP. IV.

DISCOVERY OF TRUTH.

The great treasure-house of nature is open to all, and the only fee demanded for inspection is attention.—DUTROSIER.

OBSERVATION† of nature is the only source of truth. Discursive observation is the art of noticing circumstances evident to the

* Chambers' Information.

† The term observation is used here in the sense in which it is commonly understood, signifying cognisance in general. It includes whatever information we acquire by the means of consciousness, or experience, or through the agency of the senses.

senses. Men who do this intentionally and carefully, with a view of acquiring a knowledge of phenomena and their causes, are distinguished for their varied knowledge and often for their great discoveries. Shakspere must have owed the varied facts interwoven into his delineations of human character to this source. The clever personations of Garrick were suggested by his curious observations of men and manners. Sir Walter Scott is known to have been a careful observer. It is said, 'no expression escaped him if it bore on the illustration of character.'

'Claude Lorraine, with a passionate sympathy for the beautiful, sate in the fields from sun-rise to dewy eve, watching, catching, and saturating his very soul, as it were, with all the evanescent beauties of a summer's day, as they chased each other over the face of the fair scene; fixing on canvass, taking captive and imprisoning in our cabinets, the wanton daughters of nature, that before his time never were caught, but flitted before the fascinated eye only long enough to make the heart afterwards feel more achingly the void of their vanishing. And the artist who has done all this, do we not justly call him an *imaginative* painter, to distinguish him from those meaner geniuses who were, in painting, very like Crabbe in poetry, merely faithful delineators of the vulgarer objects of social life, bunches of carrots, drunken boors, chamber maids and chimney corners.

'Has the reader ever seen Mr. Macready in the character of Macbeth? If he have, he can never forget the stupified murderer withdrawing from the chamber in which he has just done the dread act, with fascinated gaze retreatingly regarding his royal victim, and awaking with a guilty start as he runs unconsciously against his hard-souled partner in guilt, who in vain tries to infuse into the weaker spirit of her paralysed husband her own metaphysical superiority. In this scene we know that Mr. Macready's acting was perfect, for the pressure at our heart, the suspension of our breathing, and the creeping of our hair, made us *feel* that it was so. We see him now, as stealthily he places his foot over the threshold of the chamber of death to re-appear on the stage; the intensely staring eye, that cannot remove from what 'tis horror to look upon; the awfully natural absorption of his soul by that "sorry sight," which one little minute has brought about; his starting and awaking from his entranced state, as he runs against his wife in his retreat, and his full passionate burst

of blended remorse, terror, and superstition, as refusing counsel, regardless of remonstrance, heedless of probable detection, he pours forth his "brain-sickly" convictions, of having in one little moment cut the cable that had held him to the rest of the great human family. All this we can see in our mind's eye, for the actor gave us a picture of passion that time can never obliterate. But how would it have been with a cloddish unimaginative fellow, whom nature never intended should understand Shakspere? Would he not, conscious that he was among shoals and quicksands of feelings, too nice for his appreciation, seek to tear over all by a tempest of rant, which would be a more ruthless murder on Shakspere than Macbeth's on the king? And why should we be delighted with Mr. Macready's delineation, and disgusted with the ranter? Simply because the former has *observed*, treasured up, and felt every genuine exhibition of human feeling that came in his way, and applied it appropriately to all the situations to which it was related in nature. A single instance will make this clear. Mr. Kean one night, in the concluding part of the combat scene of Richard III., when supposed to be wounded to the death, before falling, steadily regarded his foe, and painfully raising his right arm in act to strike, the relaxed and dying limb, unable to second the spirit, fell heavily and harmlessly to his side, indicating merely the fierce bravery of the usurper living in all its strength, when the body which it would move, was all but a senseless clod. Pit, gallery, and boxes arose with an enthusiasm beyond description, and by their repeated plaudits bore testimony the intense naturalness of the struggle. The actor being afterwards complimented upon the *hit*, said, that he had taken the action from Jack Painter, the prize-fighter, when the latter was beaten in some one of his contests, and it immediately struck the tragedian that the very same thing would come in beautifully in the dying scene of Richard III. What was this, if not imagination? Kean saw Painter's action to be the natural effects of undying valour in vain endeavouring to contend against overwhelming power. Remembering and associating it with his previous conception of the character of Richard III., the actor saw it could be most strikingly incorporated with that picture of passion the usurper's death should present to our view. Seeing this, he combined it with his previous delineation, and thereby did precisely the same thing as the poet in using a fine simile, or the painter in

introducing sun-light over a part of his picture. It was a portion of nature carried away by the actor to be reproduced on a future and fitting occasion.'*

The beginning of all knowledge is observation. It has been shown by Mr. Mill that 'axioms,' which lie at the foundation of all reasoning and all science, 'are experimental truths—generalisations *from observation*. The proposition that Two straight lines cannot inclose a space—or, in other words, Two straight lines which have once met do not meet again, but continue to diverge—is an induction from the *evidence of our senses*.'† 'Axioms are but a class of inductions from *experience:* the simplest and easiest cases of generalisation, from the facts furnished to us by our senses or by our internal consciousness.'‡

Autobiography, or the metaphysical revelation of a man to himself, is a source of valuable psychological and moral truths. From this centre frequently radiate new lights upon human nature. But this is resolvable into a species of mental observation. It is self-inspection.

We have lately been told that 'Poetry is called upon to work in the *discovery* of truth. The imagination has always been the great discovering power. Discoveries are the poetry of science. The case is rare indeed in which, by merely advancing step by step in the exercise of the logical faculty, any new truth has been arrived at. Logic comes afterwards, to verify that which imagination sees with its far-darting glance.'‖

This seems to call upon us to recognise the imagination as a fresh source of truth. But the definition of imagination, as given by Emerson, reveals to us its origin in observation;—'The imagination may be defined to be the use which reason makes of the material world. Shakspere's imperial muse tosses the creation like a bauble from hand to hand, to embody any capricious shade of thought that is uppermost in his mind.' Hence, though we agree with Gilfillan that imagination is thought on fire, we must confess that the ignition is material.

We will, however, hear a poet's defence of his fraternity:—'Poets are vulgarly considered deficient in the reasoning faculty;

* Phrenology Tested, by A. M., of the Middle Temple, pp. 143-5.
† Logic, vol 1, p. 305. ‡ *Idem*, pp. 328-9.
‖ W. J. Fox's Lectures to the Working Classes: Genius and Poetry of Campbell, p. 55.

whereas no man was ever a great poet without having it in excess, and after a century or two, men become convinced of it. They jump the middle terms of their syllogisms, it is true, and assume premises to which the world has not yet arrived; but time stamps their deductions as invincible.'*

Imagination is based on observation, and bears the same relation to the 'material world' that the magician bears to the appliances of his art. Imagination is the dexterous and astonishing use of realities. It is a species of mental experiment, whereby, without permission of the line-and-rule men, we join strange things together, and to the surprise of every body, the junction is a happy one. 'Angelo's greatness lay in searching for untried existence.'† But observation primarily suggests the combination. If, as in the case of Angelo, imagination essays the highest flights of genius, and goes in search of untried existence, it is not existence out of nature, but founded upon nature—its success is a revelation of some hidden reality.

Some of the most praised conceptions of Shakspere have been traced by critics to the tritest observation. Instance Hamlet's remark :—

> There's a divinity doth shape our ends,
> Rough-hew them as we will.

Critics tell us, that Shakspere here fell into the conventional cant of a mechanic making skewers. But it is no detraction to cull the best phrases from the most common sources. Knight remarks :—'Philosophy, as profound as it is beautiful! says the uninitiated reader of Shakspere. But he that is endued with the wisdom of the commentators, will learn how easy it is to mistake for philosophy and poetry what really only proceeded from the very vulgar recollection of an ignorant mind. Dr. Farmer informs me, says Steevens, that these words are merely technical. A woodman, butcher, and dealer in skewers, lately observed to him, that his nephew (an idle lad), could only assist in making them; he could rough-hew them, but I was obliged to shape their ends. To shape the ends of wood skewers, *i. e.*, to point them, requires a degree of skill: any one can rough-hew them. Whoever recollects the profession of Shakspere's father, will admit that his son

* Lowell's Conversations on the Old Poets.
† J. T. Seymour; Oracle of Reason.

might be no stranger to such terms. I have frequently seen packages of wool pinned up with skewers.'* To admit the likelihood of all this, notwithstanding Mr. Knight's jeer at the 'wisdom of the commentators,' is rather to exalt than degrade the genius of Shakspere, who could derive exalted figures from humble sources. The 'Athenæum,'† far more wisely than Mr. Knight, in this instance, observes:—'This is the test of a truly great man; that his thoughts should be *things*, and become things in instantaneous act, and not for a moment mere speculations and abstractions.'

As the theories of the schoolmen subside, and men no longer ignore nature, it will become recognised as the source rather than the tool of intellect. We shall have less occasion to contend that all lofty and sublime ideas derive their value and beauty from their coherence with the instincts of sensation. 'Poetry, we grant, creates a world of its own; but it creates it out of *existing* materials.' 'Imagination' may be but 'thought on fire,' but the spark, which ignites it, is material. Is there any other distinction between the flights of the rhapsodist and those of genius, than that genius *illumines* reality and rhapsody *obscures* it? 'We know of no great generalisation that has ever been made by a man unacquainted with the details on which it rests.'‡

Experiment is invented observation. It is putting into operation certain supposed causes in order to observe their effects. An experiment may be defined as an observation, which we are at some trouble to make. Experiment is usually set down as being a process of discovering truth different from observation. It is evidently included under observation, and there is no practical advantage in separating it. Discursive, general, ordinary, or common observation is the observation of the phenomena we *find*. Experiment is observation of the phenomena we *bring together*. Experimental observation has been the great agent of modern discovery. Newton ranked it as the most valuable knowledge. Whatever is not founded on phenomena is hypothesis, and has no place in experimental philosophy. It is the principal source of accurate facts. When Jenner first communicated to John Hunter, what he thought respecting the prevention of small pox—

* Philosophy and Religion of Shakspere, pp. 173-4.
† No 946, p. 1193.
‡ Athenæum, No. 946, p. 1191.

'Don't think, but try; be patient, be accurate,' was Hunter's characteristic reply. Locke remarks:—'While the philosophy of Aristotle prevailed in the schools, which dealt often in words without meaning, the knowledge of nature was at a stand; men argued concerning things of which they had no idea; in this enlightened age, we keep to trial and experiment, as the only certain foundation of philosophy.'

Hypothesis may be noticed here as being a species of *embryo* experiment. Hypothesis is guessing at the truth. It is a conjecture or supposition relating to the cause of an effect. It imagines that where certain conditions exist, the desired result will ensue. But all these conjectures must be founded on observation. For, in the wildest conjecture, unless made by a madman, there is some reason. Hypothesis is incipient truth founded on a few facts which make it probable, but not on sufficient to make it certain. Hypothesis does not directly discover truth, but it is a guide to experiment, which does. The hypotheses of Columbus respecting an unknown continent, did not of itself discover America—but it directed the experiment of his voyage there, which did. 'To hypothesise alone is the error of the visionary and the dreamer. Practical wisdom, as far as possible, tests hypothesis by experiment. Sir C. Bell conjectured that the nervous fluid of the human body was analogous to galvanic fluid, and then, by experiments on various animals, he endeavoured to test his hypothesis. However, great thinkers arise who are best employed in contriving plans for others to execute—in telling others what they are to do. Great poets belong to this class. They are often incapable of the concentrated labour of furnishing proofs of their hypothesis. Gladly should we recognise the mission of such men. They work for humanity by thinking for humanity. 'All who think,' says Lytton, 'are co-operative with all who work.' Labour supplies our wants, thought teaches us dominion over nature. Labour is but the means of subsistence, it is thought that makes it the source of wealth by multiplying its powers.

To the value of hypothesis Mr. Mill bears this testimony, that by suggesting observations and experiments, it puts us upon the road to, independent evidence, if it be really attainable, and till it be attained, the hypothesis ought not to count for more than a suspicion. The function of hypothesis is one which must be reckoned absolutely indispensable in science. Without such

assumption, science would not have attained its present state. Nearly everything which is now theory was once hypothesis.*

Induction is systematic observation of a given class of phenomena. It consists in bringing together a variety of facts and instances, carefully and patiently viewing them in all possible lights to discover from a comparison of the whole what, if any, new principle is elicitable. Induction is an experiment with a number of facts, to see if any general result can be arrived at. Thus observation is of three kinds—discursive, experimental, and inductive. For brevity of speech, we use respectively the terms observation, experiment, and induction, as the names of the three recognised modes of investigation. But it facilitates a clear view of this subject, to note that experiment and induction are but phases of observation — and that observation is the great source of the discovery of truth.

Discursive observation and experiment are the sources of facts or particular truths. Nature, poetically says Dr. Reid, is put to the question by a thousand observations and experiments, and forced to confess her secrets. Out of these secrets induction gathers its general truths, which become the premises of argument. Facts, like stones, are of little service while scattered—it is in the edifice raised by them that their value is apparent. They have been compared to blocks, upon *one* of which, if a person stand, he has but a partially increased view; but when many are piled up, a person from their summit commands the prospect round. Particular truth seldom proves anything but itself. Argument is proving something else, and we have seen that that which is proved must be *contained* in something which proves it. In other words, an argument is an assertion or denial of something substantiated by other things—by facts.

Gall *observed* the peculiar formation of a certain head, but the one fact proved nothing, except that the head had a certain form. It was a barren observation, except that it suggested to his imagination the hypothesis that the peculiar form of the head might be caused by peculiarity of mind. This set him upon the experiment of observing the habits and dispositions of the individual in order to test his hypothesis. But the one fact of finding a peculiarity proved nothing new of any value. The two facts, though coincident, were hardly convincing. They proved only that a

* Logic, Vol. II, p. 18.

peculiar head was accompanied in one case by peculiar habits—but whether one was the cause of the other, or whether the phenomena were in any way connected, still remained unknown. When, however, Gall, Spurzheim, and others, had travelled through Europe, making observations and experiments, and at last putting all the facts and instances together, and carefully and patiently viewing them in all possible lights, and finding that they shadowed forth that the brain was the organ, the map and measure of intelligence, they inducted a general truth, which enters the lists of argument and takes its place as an addition to our metaphysical and moral treasures.

Mr. Macaulay, who, perhaps, might be accused of underrating both Bacon and Induction, with a view of exalting Aristotle, remarks that 'The vulgar notion about Bacon we take to be this, that he invented a new method of arriving at truth, which method is called induction, and that he detected some fallacy in the syllogistic reasoning which had been in vogue before his time. This notion is about as well founded as that of the people who, in the middle ages, imagined that Virgil was a great conjurer. Many who are far too well informed to talk such extravagant nonsense, entertain what we think incorrect notions as to what Bacon really effected in this matter. The inductive method has been practised ever since the beginning of the world by every human being. It is constantly practised by the most ignorant clown, by the most thoughtless schoolboy, by the very child at the breast. That method leads the clown to the conclusion, that if he sows barley he shall not reap wheat. By that method, the schoolboy learns that a cloudy day is the best for catching trout. The very infant we imagine is led by induction to expect milk from his mother or nurse, and none from his father. Not only is it not true that Bacon invented the inductive method, but it is not true that he was the first person who correctly analysed that method and explained its uses. Aristotle had long before pointed out the absurdity of supposing that syllogistic reasoning could ever conduct men to the discovery of any new principle, had shown that such discoveries must be made by induction and by induction alone, and had given the history of the inductive process concisely, indeed, but with great perspicuity and precision. We are not inclined to ascribe much practical value to that analysis of the inductive method which Bacon has given in the second book of

the Novum Organon. It is, indeed, an elaborate and correct analysis. But it is an analysis of that which we are all doing from morning to night, and which we continue to do even in our dreams.'*

It is not 'some fallacy in the syllogistic reasoning' which Bacon is supposed to have detected, it is rather the partial protection against error afforded by syllogisms, which he exposed and provided against, for which he is estimated. Certainly Aristotle must have had a very different opinion of the value of inductive philosophy from that entertained by Bacon, or he would have indoctrinated his disciples with it. Few will doubt that had Bacon's Novum Organon appeared in the place of Aristotle's logic, and Aristotle's work in the place of Bacon's, that the advancement of learning in the world would now be in a very different state. Could Bacon have arrested the attention of the ancient sages with his methods of discovering new principles, ancient philosophy, instead of being a treadmill, would have been a path, and we should not have had a contempt for all learning which was useful. When Posidonius said that we owed to philosophy the principles of the arch and the introduction of metals, we should not have had Seneca repudiating such insulting compliments, nor Archimedes considering that geometry was degraded by being employed in anything useful.

But these observations of Macaulay have the merit of showing us that induction has its foundation in nature, and afford a further confirmation of our views, that observation is the source of our knowledge, and that it is the province of logic to teach us to systematise our thoughts. Observation, experiment, hypothesis and induction, are but different names for the operation—varying in degree, in method, in expedient, and elaboration—whereby we discover truth. Nature is the treasure-house of truth, and the sole fee of appropriation is attention.

Much discussion has taken place upon the nature of necessary truths. Mr. Mill, however, after an elaborate analysis of Dr. Whewell's theory, pronounces that 'nothing is necessary except the connection between a conclusion and the premises.' A necessary truth is commonly defined as a proposition, the negation of which is not only false, but inconceivable. Mr. Mill contests this doctrine in words embodying suggestions of great value.

* Macaulay's Hist. Essays, vol. 2, p. 407.

'Now I cannot but wonder that so much stress should be laid upon the circumstance of inconceivableness, when there is such ample experience to show that our capacity or incapacity of conceiving a thing has very little to do with a possibility of the thing in itself; but is in truth very much an affair of accident, and depends upon the past history and habits of our own minds. There is no more generally acknowledged fact in human nature, than the extreme difficulty at first felt in conceiving anything as possible, which is in contradiction to long established and familiar experience; or even to old and familiar habits of thought. And this difficulty is a necessary result of the fundamental laws of the human mind. When we have often seen and thought of two things together, and have never in any one instance either seen or thought of them separately, there is by the primary law of association an increasing difficulty, which in the end becomes insuperable, of conceiving the two things apart. This is most of all conspicuous in uneducated persons, who are in general utterly unable to separate any two ideas which have once become firmly associated in their minds; and if persons of cultivated intellect have any advantage on the point, it is only because, having seen and heard and read more, and been more accustomed to exercise their imagination, they have experienced their sensations and thoughts in more varied combinations, and have been prevented from forming these inseparable associations. But this advantage has necessarily its limits. The man of the most practised intellect is not exempt from the universal laws of our conceptive faculty. If daily habit presents to him for a long period two facts in combination, and if he is not led during that period either by accident or intention to think of them apart, he will in time become incapable of doing so even by the strongest effort; and the supposition that the two facts can be separated in nature, will at last present itself to his mind with all the characters of an inconceivable phenomenon. There are remarkable instances of this in the history of science: instances, in which the wisest men rejected as impossible, because inconceivable, things which their posterity, by earlier practice and longer perseverance in the attempt, found it quite easy to conceive, and which everybody knows to be true.[1]

'If, then, it be so natural to the human mind, even in its highest state of culture, to be incapable of conceiving, and on that ground to believe impossible, what is afterwards not only found

to be conceivable but proved to be true; what wonder if in cases where the association is still older, more confirmed, and more familiar, and in which nothing ever occurs to shake our conviction, or even suggest to us any conception at variance with the association, the acquired incapacity should continue, and be mistaken for a natural incapacity? It is true our experience of the varieties in nature enables us, within certain limits, to conceive other varieties analogous to them. We can conceive the sun or moon falling; for although we never saw them fall, nor ever perhaps, imagined them falling, we have seen so many other things fall, that we have innumerable familiar analogies to assist the conception; which after all, we should probably have some difficulty in framing, were we not well accustomed to see the sun and moon move, (or appear to move,) so that we are only called upon to conceive a slight change in the direction of motion, a circumstance familiar to our experience. But when experience affords no model on which to shape the new conception, how is it possible for us to form it? How, for example, can we imagine an end to space or time? We never saw any object without something beyond it, nor experienced any feeling without something following it. When, therefore, we attempt to conceive the last point of space, we have the idea irresistibly raised of other points beyond it. When we try to imagine the last instant of time, we cannot help conceiving another instant after it. Nor is there any necessity to assume, as is done by a modern school of metaphysicians, a peculiar fundamental law of the mind to account for the feeling of infinity inherent in our conceptions of space and time; that apparent infinity is sufficiently accounted for by simpler and universally acknowledged laws.'*

Thus we stand on the verge of boundless possibility. What truths may yet be discovered in that great and untrodden field, which lies without our experience, no man can tell. All we have yet brought between assertion and proof, is all we have yet conquered, is all that we as yet know, is all that we can yet rely upon. The search after the untried is the highest and apparently the inherent aspiration of man. The revelation of new worlds continually rewards his noble ambition. At once arrested and allured by the magnificence of nature—we wonder, we work, we wait.

* Mill's Logic, vol. 1, pp. 313-17.

CHAP. V.

FACTS.

We must never forget that accurate and multiplied quantitative facts form the only substantial basis of science.—PARKER.

As clear fountains send forth pellucid streams, so do clear truths give accurate sciences. The more definite the facts, the more perfect the science; it is therefore of importance that all facts should be capable of being tested by the standard of physical certainty. Dr. Reid says, that 'the inquirer after truth must take only facts for his guide.' It is then of moment that he takes true and not false guides. A writer in the 'Monthly Repository' observes, that 'the basis of all knowledge is such an extensive induction from particular facts, as leads to general conclusions and fundamental axioms'—and if the facts are erroneous, evidently the conclusions will be also erroneous. He also remarks, that 'in reasoning, all sciences are the same, being founded on an examination of facts—comparison of ideas.' But if the examination is incomplete, or the facts admitted incorrect, the comparison will be alike defective and the reasoning vitiated. If suppositions or conjectures are mixed up with facts, the inductions from them will be suppositions, and the conclusions but conjectures.

There are three words—consciousness, conscience, and conscientiousness—very much alike to the ear but very different in signification. Consciousness, is feeling—conscience, the sense of right and wrong—conscientiousness, the practice of what is believed to be right. Conscience and conscientiousness are often confounded. We say, lawyers have no conscience, we mean no conscientiousness. They know right from wrong as men, but not professionally. It is with consciousness that the logician has to deal. Consciousness is the primary source of knowledge. Consciousness and the 'Evidences of the Senses' are synonymous terms. Facts referable to consciousness are said to be physically certain. The evidence of the senses is the highest standard of certainty.

The intuitive principles of belief are—1st. A conviction of our own existence. 2nd. A confidence in the evidences of our senses. 3rd. In our mental operations. 4th. In our mental identity.

5th. In the conformity of the operations of nature. These truths of intuition or consciousness are the foundation of all knowledge. Truths which we know, by way of inference, are occurrences which took place while we were absent—the events of history and the theorems of mathematics. But the truths known by intuition are the original premises from which all others are inferred. Our assent to the conclusion being grounded upon the truth of the premises, we could never arrive at any knowledge by reasoning, unless something could be known antecedently to all reasoning.

'Whatever is known to us by consciousness, is known beyond possibility of question. What one sees, or feels, whether bodily or mentally, one cannot but be sure that one sees or feels. No science is required for the purpose of establishing such truths; no rules of art can render our knowledge of them more certain than it is in itself. There is no logic for this portion of our knowledge.'*

All discussions pertaining to the nature and limits of intuition or consciousness are referred to the higher or transcendental metaphysics, but all the facts that compose evidence and become the grounds of inference are, according to the view taken here, necessarily subjects of examination.

'*Cogito, ergo sum*—I think, therefore I am, argued Des Cartes. We learn by this that consciousness of the operations of the mind is the strongest evidence of our existence. It cannot be proved so forcibly by any other means; and although Des Cartes' language may appear to involve a logical fallacy, yet the proof of our personal existence which we have from *thinking*, is the fullest and best we are acquainted with.'†

There is a numerous class of facts from which all men draw conclusions, which facts are not referable to the evidence of the senses. There are the facts of testimony. Testimony is founded on laws almost as fixed and certain as those of nature. All our knowledge, scientific, literary, historical—all except what arises from our experience and consciousness—depends on it. In the administration of justice it is the sole guardian of property and life. If a man of known integrity and veracity state a fact, without any possible motive of self-interest, and evidently subject

* J. S. Mill: Logic, vol. 1, p. 7.
† Rev. Robert Amalie.

to no delusion; and if others of like character, who could have no understanding or collusion with him, state the same, men are nearly as certain of it as of any truth in mathematics. I believe in the existence of Rome and the facts of astronomy on this evidence, although I never saw the city or examined the stars through a telescope.

The conclusiveness of testimony is designated moral certainty. The value of testimony depends on three things. 1. On the nature of the subject. Some subjects are capable of more accurate observation than others. 2. On the powers and character of the observer—his ability to understand or note that of which he testifies—and his honesty in common matters. 3. On the number of our informers. Several persons are less likely to be imposed upon than one.

Testimony or moral certainty is inferior to physical certainty. A physical certainty bears uniformly the name of certainty, while a moral certainty is characterised as a probability. Great, very great may be the probability, still it is less in reliableness than a physical certainty. The evidence of Cato or Aristides would be very conclusive—yet somewhat less certain than that which our own senses have proved.

The conclusions from moral certainties are obtained like other conclusions, by induction. The induction from moral facts is like the induction from physical facts, with this difference—that the conclusions from moral facts are probabilities, like the facts on which they are founded. Whatever has physical certainty in its favour is considered demonstrable, and when sufficient probable evidence is adduced in favour of a proposition, it is considered to be fairly proved. Some persons, biased by the strictness of mathematical proof, insist upon the same accuracy in moral investigations. I have elsewhere pointed out the juvenility and infatuation of this error. Insist upon demonstration where the nature of the questions admits it. Less should not, in such case, suffice. Accept probability where probability is the sole evidence attainable. Never ask more than reason can grant. We must admit gradations of validity. What we are conscious of, we *know*. All we receive on testimony, we *believe*. Physical certainty is *knowledge:* moral certainty, *belief*.

Hume remarks, in his 'Essay on Probabilities,' that 'Mr. Locke

divides all arguments into demonstrative and probable. In this view, we must say, that it is only probable all men must die, or that the sun will rise to-morrow. But to conform our language more to common use, we ought to divide arguments into *demonstrations*, *proofs*, and *probabilities*. By proofs, meaning such arguments from experience as leave no room for doubt or opposition.'*

Conjecture is probable truth. Some subjects only furnish a sufficient number of facts to make them probable in the lowest degree — not to decide them as positively true. The propositions expressing results pertaining to such subjects are called conjectures.

A conjecture founded on no fact or upon too few to make it likely, is called a vagary.

It will be seen that probability is a thing of degree. A probability may vary in weight from a moral certainty, where it ranks next to a physical certainty, down to a conjecture, and descend lower in likelihood till it is lost in conjecture.

Lord Kames remarks, in his preface to his 'Sketches'—'Most of the subjects handled in the following sheets, admit but of probable reasoning; and, with respect to such reasoning, it is often difficult to say, what degree of conviction they ought to produce. It is easy to form plausible arguments; but to form such as can stand the test of time, is not always easy. I could amuse the reader with numerous examples of conjectural arguments, which, fair at a distant view, vanish like a cloud on a near approach.' Did all authors so judiciously apprise their readers of the probable logical value of their speculations, fewer would be misled than now.

To numerous questions of undoubted interest, which have been agitated in all ages, only a moderate degree of certainty attaches —these are termed speculative. Such subjects may afford but few facts and instances, and the chances of conclusiveness may seem remote—yet ultimate results are not to be despaired of: the new comparison of conjectures and the arrangement of facts daily throws new light on age-contested points. Systems of conduct should not be founded on conjectures in opposition to evident moral utility; but if speculation is kept within the

* Hume's Essays, vol. 2, p. 59.

sphere of speculation, it may be prosecuted with safety and prospect of success.

There are problems in metaphysics as there are in mathematics, which may be demonstrated to be insolvable. To describe the limit of human power with respect to contested questions will yet result from speculative controversy. The capacities of our understanding will be one day well considered, the extent of our knowledge discovered, and the horizon found which sets bounds between the enlightened and the dark part of things—between what is and what is not comprehensible by us. But this will only be when the *untried* has been *universally* attempted in all directions. Bailey, I think, has defined truth as being that which is universally accepted after having been universally examined. Little of this truth is yet extant. When every man shall be a thinker, when the autobiography of intellect shall be more freely furnished than it ever yet has been, unanimity of opinion not yet dreamed of will prevail. Harmony of opinion is the sign of intellectual conquest—the standard-bearer of truth: no advocacy is victorious while dissent occupies the field.

What we *know* to be true, is *knowledge*; what we have only reason to believe true, is *opinion*. All human information is made up of knowledge and opinion. The primary importance of knowledge is evident from the fact that knowledge is the umpire of all opinion. We believe in the existence of the ruins of Palmyra and Thebes, and in certain discoveries of algebraists and astronomers. It is our *opinion* that these things are true, although we may never have visited Palmyra or Thebes, nor made the calculations of the algebraist, nor the observations of the astronomer. In these cases our belief is founded on our *experience* and knowledge of mankind. It is quite true that travellers exaggerate, and scientific men are sometimes mistaken; but we know that there is always *some* truth at the bottom of what is communicated by well-meaning writers. More or less, every man's *experience* assures him of this; and it is the cause of our reliance on the records of history, and the reports of science. Therefore, since all information is made up of knowledge and opinion, plainly knowledge is the one thing which comprises all intelligence.

'Questions of fact,' observes Pascal, in his celebrated 'Provincial Letters,' 'are only to be determined by the senses. If what you

assert be true, prove it to be so; if it be not, you labour in vain to induce belief. All the authority in the world cannot enforce or alter belief as to facts; nothing can possibly have power to cause that not to be which actually *is*.'*

A remarkable instance of the verification of what was assumed to be is related of Pascal by Goodrich. 'Pascal was a philosopher even in childhood. At a very early age he was taught the ten commandments. For several days after, he was observed to be measuring the growth of a blade of grass. When asked the meaning of this, he replied, "The fourth commandment says, 'Six days shalt thou labour, but the seventh is the Sabbath in which thou shalt do no work.' Now I wished to ascertain if nature obeyed this great law, and therefore measured the grass, to see if it grew as much on Sunday as on other days."'†

'We are informed,' says Beattie, 'by Father Malebranche, that the senses were at first as honest faculties as one could desire to be endued with, till after they were debauched by original sin; an adventure from which they contracted such an invincible propensity to cheating, that they are now continually lying in wait to deceive us. But there is in man, it seems, a certain clear-sighted, stout, old faculty, called *reason*, which, without being deceived by appearances, keeps an eye upon the rogues, and often proves too cunning for them.'‡

Though it is so abundantly obvious that the evidences of our senses, internal and external, are, in effect, the sources of all certainty, yet we are not warranted in rejecting, as mere hypothesis, every theory which we cannot at once corroborate. When Euler remarked of his new law of arches, 'This will be found true, though contrary to all experience'—when Gall exclaimed of his new philosophy of the sensorium, 'This is true, though opposed to the philosophy of ages'—they expressed demonstrable truths hidden from the multitude. They announced new generalisations to man. New truths are commonly found to be old unnoted experiences, for the first time subjected to classification, and presented in a scientific form.

To me it seems almost in vain to urge men to notice facts who have never noticed themselves. The truest standards of certainty

* Letter xviii.
† Fireside Education, p. 89.
‡ Essay on Truth, p. 106.

arise from individuality of retrospection. An intelligent man is, himself to himself, the measure of all things in the universe.

In appealing to the young on the aspiration after improvement, one cannot say 'Consult your aptitudes—follow your bias.' This is the sole appeal-injunctive to which all natures can respond. But in this half-natured, half-trained, doubtfully-conditioned state of society, though the generous would be incited to noble deeds, the sordid would lay their vulture claws on the world, and the unprincipled victimise their fellows. You have, therefore, to say, 'Man, do what thou listest, provided it be compatible with the welfare of thy fellow men.' Men are not well-natured, and we have thus to guard individuality, and qualify the appeal, and so we miss the soil of great enterprise. Great is the disadvantage. For the fulcrum which is to raise men is without their natures—remote in the wide world.

Man should begin with himself. He loves Truth—it is the first impulse of his nature. He loves Justice—the bandit on the throne, as well as the bandit in the forest, respects justice in some form or other. Man loves Cheerfulness—it is the attribute of innocence and courage. He loves Fraternity—it knits society together in brotherhood. These are standards. His codes of life and judgment arise from these aspirations. That which accords with these principles is *reasonable*. Whatever develops these principles in conduct is *moral*. These sentiments are to be confirmed by his own observations. His experience in connection with these rules is the light with which he may examine religions, creeds, books, systems, opinions.

The right understanding of physical and moral facts greatly depends upon intellectual character—and there enters largely into the recondite and ultimate inquiries of intelligent men another class of facts, called mental facts. There is no chance of identifying these without the power of self-analysis, which is one reason why metaphysic ability belongs to so few, and why questions involving metaphysical considerations are such profound enigmas to the majority of the people. The illiterate in these things are easily led or misled by words. They who will not bow before a throne fall prostrate before a sound.

The first principles of things are few. The axioms from which men date their reasoning are chiefly personal. They are expressed in an infinite variety of ways, occasioned by the various concep-

tions of those who conceive them, and by the different capacities to which they are adapted when offered for the instruction and guidance of others. But this must not mislead us as to the number, and overwhelm us with a sense of complexity, where in fact simplicity reigns. Those who have the power of self-analysis make for themselves rules of conduct, and the best are originated in this way—for when a man recasts his acquirements of sense and education, in order to see on what all rests, and what are essential standards of action and judgment, he resolves all into few, and those the clear and strong. Rob Roy's self-examination paper is presented to us in those lines which Sir Walter Scott, with grace and justice, characterised as the 'high-toned poetry of his gifted friend Wordsworth.'

Say, then, that he was wise as brave,
As wise in thought as bold in deed;
For in the principles of things
He sought his moral creed.

Said generous Rob, 'What need of Books?
Burn all the statutes and their shelves!
They stir us up against our kind,
And worse, against ourselves.

We have a passion, make a law,
Too false to guide us or control;
And for the law itself we fight
In bitterness of soul.

And puzzled, blinded, then we lose
Distinctions that are plain and few;
These find I graven on my heart,
That tells me what to do.'

Sir Walter Scott himself has enforced the same views:—

'How much do I need such a monitor,' said Waverley to Flora. 'A better one by far Mr. Waverley will always find in his own bosom, when he will give its still small voice leisure to be heard.

All that hath been majestical
In life or death, since time began,
Is native in the simple heart of all,—
The angel heart of man.—*Lowell.*

To awaken the senses and instruct them and direct them aright in the art of observation, is a great and essential undertaking. All scattered aids need collecting together. De la Beche in 'Geology,' and Miss Martineau have written books, entitled 'How to Observe.' This quality is the distinction between the natural and artificial man—the natural man observes what is

in nature—the artificial notes what he finds in books—the one depends on himself—the other on an encyclopædia. We want contrast, in order to know as well as to explain. Foreigners observe us better than we observe ourselves. The common escapes our attention. To know a fact fully we seek its opposite to compare it with.

Were men reared with the powers of men without the genius of the child being impaired, the ability to observe would be more general and perfect among us. Children stop at everything to question its nature, at every word to ask its import. It was the aim of Pestalozzi to cultivate by his system of tuition this incessant questioning. But parents among the poor know not the value of the habit, or knowing it have not time to gratify it, and thus this happiest aptitude of childhood is repressed.

With regard to the analysis of groups of facts, Mr. J. S. Mill remarks—'The observer is not he who merely sees the thing before his eyes, but he who sees what parts that thing is composed of. To do this well is a rare talent. One person from inattention, or attending only in the wrong place, overlooks half of what he sees; another sets down much more than he sees, confounding it with what he imagines, or with what he infers; another takes note of the *kind* of all the circumstances, but being inexpert in estimating their degree, leaves the quantity of each vague and uncertain; another sees indeed the whole, but makes such an awkward division of it into parts, throwing things into one mass which require to be separated, and separating others which might more conveniently be considered as one, that the result is much the same, sometimes even worse, than if no analysis had been attempted at all.'*

In the case of the Leigh Peerage there was a number of witnesses examined in the House of Lords, as to the existence of a certain monument in Stonely Church—'The first witness described the monument as being black; the second spoke of it as a kind of dove-colour; the third said it was black and white; the fourth said it was originally white, but dirty, when he saw it; the fifth differing from the others, said it was blue; the next witness described it as a light marble, but said it had a dark appearance as if it had been bronzed, and the last witness spoke of it as being of a light grey colour. Then, as to the form of the monu-

* Logic, vol. 1, p. 438.

ment, the first witness said it was oblong; the next said it was square at the top, and came down narrower to the bottom, and there rested on a single truss; the third witness described it as being square at the bottom, resting upon two trusses, and went up narrower and narrower to a point at the top; the fourth witness said it was angular at the top; the next said it was square at the bottom, was brought to a point in the middle, and was then curved into a sort of festoon; the sixth witness stated that it was square at the top and bottom, and had a curve; and the last said it was square at the top and bottom. As to the language of the inscriptions, the first witness stated that the names of *Thomas* and *Christopher Leigh* were in English; the next said the inscription was not in English; the third said there was a great deal in English; the fourth witness said the whole, (with the exception of the name *Christopher Lee*), was in a language, which he did not understand; the next witness stated that the inscription was all in English, except the words *Anno Domini*; and the last witness said it was not in English.'*

All these witnesses agree as to the fact in dispute, but their variances in testimony illustrate the common inattention of observation—and this case further admonishes us that if such differences may exist as to a question of fact, where the senses are the same, little wonder that differences exist as to matters of opinion, where intellectual capacity and information are so various.

We know from experience that the sportsman sees a point which is hidden from the unpractised aimer—the painter sees traits of character of light and shade in an object which the untaught limner never observes; the musician distinguishes harmonies and discords that fall unnoted on the uneducated ear. Thus we learn that by cultivation we can increase natural susceptibility to observe.

The extent is surprising to which the unanalytic are in ignorance of the real nature of phenomena. 'There is nothing which we appear to ourselves more directly conscious of, than the distance of an object from us. Yet it has long been ascertained, that what is perceived by the eye, is at most nothing more than a variously coloured surface; that when we fancy we see distance,

* Times, May 10, 1828.

all we really see is certain variations of apparent size, and more or less faintness of colour.'*

In preparing to support an argument on any question, we must first determine the sources whence the facts are to be collected. Instance: The objects of municipal laws are rights and crimes.

The evidence of rights are:—1. Public consent. 2. Testimony. 3. Records.

The evidence of crimes are:—1. Confession. 2. Previous malice. 3. Testimony.

This outline of the investigation prosecuted, the inquirer next consults the authors who treat of the rules which are applied for determining the facts of public consent, testimony, records, confessions: he is then able to support his own argument in a valid manner, or prepared to examine the facts offered by an opponent in support of an opposite view.

The opinion may be hazarded that it is not so much from want of capacity to observe that error arises, as from the want of conviction that we should observe well before we attempt to infer. Nature is inventive, and desire, once awakened, will, without formal rules, find out a thousand modes of gratification. The foundation for a solider logic than now prevails will be laid when the people are impressed with the great importance of looking well to facts as the data of all inferential truth.

There is a noted aphorism of Condillac, to the effect that the one sufficient rule for discovering the nature and properties of objects is to name them properly, as if, observes Mr. J. S. Mill, 'the reverse was not the truth, that it is impossible to name them properly except in proportion as we are already acquainted with their nature and properties.' Need it be added that this knowledge is only to be had by patient observation?

To assist this habit, Dr. Watts recommends the thinker to ascertain if a given idea is clear and distinct, obscure and confused, learned or vulgar, perfect or imperfect, adequate or inadequate—true or false. View a subject, says he, as through a telescope, so as to command a clear view of it; examine its whole bearings as you look over a globe; consider it in its several properties—anatomise it as with a scalpel. Take cognizance of its various aspects as though inspecting it through a prismatic glass. Whenever we contemplate a single object in nature is

* Mill' Logic, vol. 1, p. 7.

obvious it must have duration, size, weight, form, colour, such qualities being essentially present in all adequate conceptions of physical phenomena.

It was objected to the 'Cricket' of Mr. Dickens, that his delineation of Bertha was wanting in truthfulness. The teachers of the blind who knew their nature could detect the departure from the reality of their habits in the sketch of Bertha. The study of the blind was necessary to insure success. We may not be able in any one book to give rules for the study of all subjects, but we may indicate that we ought not to speak of what we do not know, and that if we mean to introduce certain facts into our speech or writing, we should consult the records and experience of those persons who are known to have written upon the subject, and follow the best directions they give, and we shall generally attain accuracy.

Mr. Combe observes, in his introduction to his notes on the United States of North America, p. xi.—'I was told that a *certain person* boasts of having given Miss Martineau erroneous information for the purpose of leading her into mistakes; and another in Philadelphia assures his friends that he "crammed" Capt. Marryatt with old "Joe Millers," which the Capt. embodied into his books as facts illustrative of American manners. This seems to be a case in which some uncertainty must ever exist as to the value of the facts collected by travellers. They cannot observe all, or test half that they do observe. They must rely on testimony. But they might do this— They might tell us precisely the kind of authority they followed, and then the reader could form some opinion of the value of what was communicated. Had Miss Martineau and Captain Marryatt given the name and addresses of their informants, the latter would now be punished by being infamously known throughout Europe, and all future travellers warned from them—and all future informants warned by their example. Where informants cannot be mentioned by name and address, the chances are, they cannot be trusted. When first connected with public proceedings, I found myself made the depository of innumerable bits of scandal, and ominous reports of public characters. To all who told me anything, if I attached importance to it, I made it a rule to ask—'May I mention it to the party with your name?' 'O, no, I would rather not,' was the common reply. To all written communications I

answered—'Please add your name and address—and may I publish them if occasion requires?' 'O, no, don't,' would be the general injunction. Thus I found that huge reports, inflated as balloons, shrunk like them when pricked by the pin of a question —'Will you answer for it?' Thus I saved myself from being imposed upon by, or being the retailer of, reports for which the originator or relator would not or could not vouch.

'Upwards of twenty years ago,' says George Combe, 'I accompanied a member of the bar of Paris, a philosopher and a man of letters, on a visit to the Highlands of Scotland. At Callendar a boy of twelve or thirteen years of age attended as a guide to some interesting spot, and in external appearance he seemed to be in every respect one of the common lads of the village. My Parisian friend entered into conversation with him; asked him if he had been at school, and soon discovered that to a tolerable acquaintance with the Greek and Latin languages, he added a pretty extensive knowledge of arithmetic and geography, and was then engaged in the study of mathematics. My friend conceived that the boy was an average specimen of the peasantry of the country, and greatly admired the educational attainments of the Scotch people, which he had previously heard highly extolled. But,' adds Mr. Combe, 'the boy was the natural son of an English officer, who had resided in the neighbourhood, and who, while he ordered him to be reared in the hardy habits of the Scottish Highlanders, had provided ample funds for his mental education.'*

It is difficult to believe in this Frenchman being a 'philosopher, making, as he did, a national induction from a single instance. Had he previously inquired, as he ought to have done, the particulars of that lad's life and rearing, before coming to so large a conclusion, he would at once have discovered the error he was falling into.

In the Registrar General's Report of 1840, the mean of married persons unable to write is presented. The conclusion is based upon the statistics of nine counties. But when it was found that only three per cent. of the persons marriageable, did marry, the datum was found insufficient to afford sure results. This fact is given by Mr. Combe in the same book. Then how many boys ought our 'philosopher' to have questioned before making his vast inference?

* Intro. to notes on United States of North America, p. 10., vol. I.

Another instance of the value of a question I extract from the same work. Mr. Combe says:—'A few years ago, when travelling in Somersetshire, I saw four horses, attended by two men, drawing a light plough in a light soil. "What a waste of labour is here," said I to an intelligent farmer; "in Scotland, two horses and one man will accomplish this work." "We rear and train young horses for the London market," said he; "two of the four which you see are serving an apprenticeship to labour."' Had Mr. Combe asked a few questions as to the correctness of his assumed inference, he would have been saved from his erroneous conclusion. We should be wary of unquestioned data.

When Murray's Grammar was first placed in my hands, I found in it certain references to the Canons of Language in the larger edition. I questioned my teacher as to what it meant. 'It is a trick of the printer,' he answered, 'to induce you to buy the larger volume.' I do not believe this now. I believe that it was a necessary reference. An author who has written upon a given subject, naturally finds his own ideas coincident illustrations of his views, and honestly refers to them. In this book I have made a few references to previous works of mine, and it has struck me that nine out of ten of the readers will set this down to artifice or egotism. Yet it is neither. I have referred only to avoid the full quotation of some necessary illustration of the argument. Yet few will penetrate to the fact, and most will be apt to infer a trick from appearances.

CHAP. VI.

SCIENCE.

Whatever we know must be in the number of the primitive data, or of the conclusions which can be drawn therefrom.—J. S. Mill.

To have reached, in the study of observed phenomena, the point of perception indicated in this motto, and to feel the full force the remark, is to have imbibed the spirit of science—whose

traits are clear distinctions, accurate classification, and strict reference to primitive data. The bases of all science are methodical facts. The first step to the perfection and enlargement of a science is the resolution of its propositions into axioms, and into propositions which are to be proved. Dr. Reid observes—'This has been done in mathematics from the beginning, and has tended greatly to the emolument of that science. It has lately been done in natural philosophy, and by this means that science has advanced more in 150 years than it had done before in 2,000. Every science is in an unformed state until its first principles are ascertained; after this it advances regularly, and secures the ground it has gained.'

Classification is one of the first steps to science. The maxim in government, divide and conquer, retains, when applied to science, all its wisdom without its machiavellianism. The young grammarian reduces the mass of words, that so threaten to confound his powers, to a few natural classes, and he conquers them separately with ease.

'The single power by which we discover resemblance or relation in general, is a sufficient aid to us in the perplexity and confusion of our first attempts at arrangement. It begins by converting thousands, and more than thousands, into one; and, reducing in the same manner the numbers thus formed, it arrives at last at the few distinctive characters of these great comprehensive tribes, on which it ceases to operate, because there is nothing left to oppress the memory or the understanding.'*

Morell has spoken more comprehensively on this subject—'That human knowledge does not consist in the bare collection and enumeration of facts; this alone would be of little service were we not to attempt the classification of them, and to educe from such classification general laws and principles. The knowledge, which consists in individual truths, could never be either extensive or definite—for the multiplicity of objects which then must crowd in upon the mind only tends to confound and perplex it, while the memory, overburdened with particulars, is not able to retain a hundredth part of the materials which are collected. To prevent this, the power of generalisation comes to our aid, by which the individual facts are so classified under their proper conceptions, that they may at the same time be more easily

* Brown's Moral Philosophy, Lect. xvi.

retained, and their several relations to all other branches of knowledge accurately defined. The colligation and classification of facts, then, we may regard as the two first steps, which are to be taken in the attainment of truth.'*

Aristotle, says Morell, classified the *matter*, Kant the *forms*. Aristotle was the first man who undertook the gigantic task of reducing the multiplicity of all the objects of human knowledge to a few general heads—1. Substance. 2. Quality. 3. Quantity. 4. Relation. 5. Action. 6. Passion. 7. Place. 8. Time. 9. Posture. 10. Habit. Aristotle's philosophy was *objective*, Kant's *subjective*. Kant's categories were twelve. 1. Unity. 2. Plurality. 3. Totality. 4. Affirmation. 5. Negation. 6. Limitation. 7. Substance. 8. Casuality. 9. Reciprocity. 10. Possibility. 11. Actuality. 12. Necessity.

'It is a fundamental principle in logic, that the power of framing classes is unlimited, as long as there is any (even the smallest) difference to found a distinction upon.'†

What Geoffroy Saint Hilaire has said of natural history is applicable to all science:—'The first problem to be solved by him who wishes to penetrate deeply into this study, consists evidently in the formation of clear and precise distinctions between the various beings. This is the most elementary problem, in so far as it precedes all the others; but it is in reality, in most cases, complicated and full of difficulties. Its accurate solution requires—first, *Observation*, which makes known the facts; next, *Description*, which fixes them permanently; then *Characterisation*, which selects and displays prominently the most important of them—and lastly, *Classification*, which arranges them in systematic order.'‡

Of the value of classification, Lamartine has given a fine illustration:—'Montesquieu had sounded the institutions and analysed the laws of all people. By *classing* governments he had compared them, by comparing them he passed judgment on them; and this judgment brought out, in its bold relief and contrast, on every page, right and force, privilege and equality, tyranny and liberty.'‖

Familiarity with the characteristics of science imparts consi-

* Morell's Hist. of Speculative Phil., p. 24, vol. 1.
† Mill, p. 165, vol. 1.
‡ T. W. Thornton: Reasoner No. 72, p. 564.
‖ Lamartine's Hist. Girondists, pp. 14-15, vol. 1.

derable power for the detection of fallacy. A logician is imperfect without scientific tastes and habits. The man of science has all his knowledge systematised and arranged. What other people have in confusion, he has in order. The elements of knowledge are, more or less, as has been observed, known to all men—but in their perfect, communicable, and usable state, they are known only to the educated and scientific man. What training is to the soldier, science is to the thinker. It enables him to control all his resources and employ his natural powers to the best advantage. It is this which constitutes the superiority of the educated over the ignorant. Astronomy, navigation, architecture, geometry, political economy, morals, all rest, or should rest, and do rest, if they have attained to the perfection of science, on primary facts and first principles. Every step can be measured by an axiom—every result can be traced to a first principle.* To detect error, then, in any province of investigation, or any domain of argument, the logician first looks to the primary principles on which it is based, and thus tests the legitimacy of its conclusions.

As respects those who deal in things professedly *above* reason, it was well said by an anonymous writer of the old school of sturdy thinkers,—'Of such men as these I usually demand, whether their own assent to things they would have us believe, be grounded upon some *rational argument*. If they say 'tis not, they are fools to believe it themselves; and I should add to the number of fools, if, after this acknowledgment, I should believe them: but if they say it is, I desire them to produce their argument; for since 'tis framed by a human understanding, the force of it may also be comprehended and judged of by a human understanding: and 'tis to no purpose to say that the subject surpasses human reason: for if it do so indeed, it will surpass *theirs* as well as *mine*, and so leave us both upon even terms. And let the thing assented to be what it will, the assent itself must be founded upon a *sufficient reason*, and consequently upon one that is *intelligible* to the human intellect that is wrought on by it.'†

'"What is it?"—"'Tis impossible the same thing should be, and not be at the same time," are maxims of such universal usefulness, that without them we could neither *judge*, *discourse*,

* See Beauties and Uses of Euclid, chap. vi., Logic of Euclid.
† A Discourse on Things above Reason, 1681.

nor *act*. These principles may not always make their appearance in formal propositions, but still they guide all our thoughts in the same manner as when a musician plays a careless voluntary upon a harpsichord—he is guided by rules of music he long since became familiar with, though now scarcely sensible of them.

'A butcher loses his knife, and looks all about for it, and remarks as the motive of his search, "I am sure it must be somewhere or other." By which rude saying it is evident he is guided by the axiom last mentioned. Had he not the knowledge of this axiom beforehand, did he think it possible that his knife could be *no where* or in *no place*, he would never take pains to look for it. We may observe many such axioms as this guiding the actions of the vulgar, and it is no unworthy speculation to observe their behaviour and words, which proceed from uncorrupted nature, and retrieve the axioms from which their conduct proceeds.'*

The outlines of the science of morality are thus comprehensively sketched by Sir James Mackintosh: the origin, value, and application of first principles are indicated with his usual felicity. 'The usages and laws of nations, the events of history, the opinions of philosophers, the sentiments of orators and poets, as well as the observations of common life, are in truth, the materials out of which the science of morality is formed; and those who neglect them are justly chargeable with a vain attempt to philosophise without regard to fact and experience—the sole foundation of all true philosophy.

'The natural order undoubtedly dictates that we should first search for the *original principles* of the science in human nature; then apply them to the regulation of the conduct of individuals, and lastly employ them for the decision of those difficult and complicated questions that arise with respect to the intercourse of nations.'

To search for ultimate principles is to discover at a glance the whole bearings of a great question. Through what clouds of politics had the historian of Rome penetrated when he announced that the principles of a free constitution are irrecoverably lost when the legislative power is nominated by the executive.

This habit—it cannot be too often insisted on—aids not only the

* Solid Philosophy, asserted against the Fancies of the Ideists. (Locke's Understanding is the work controverted). By J. S. London, 1679.

acquisition of knowledge, but also its *retention*. 'Around these first principles, as around a standard, the thoughts naturally associate. Touch but a remote chord of any question, and it will vibrate to the central principle to which it has once been well attached. Every relative impression owns a kindred connection, and the moment one is attacked, it, like a faithful sentinel, arouses a whole troop, which, marshalled and disciplined, bear down and challenge the enemy.'*

What Rogers has so exquisitely sung of the associations of childhood, is true of the associations of science.

> Childhood's loved group revisits every scene,—
> The tangled wood-walk and the tufted green.
> The school's lone porch, with reverend mosses grey,
> Just tells the pensive pilgrim where it lay.
> Mute is the bell which rang at peep of dawn,
> Quick'ning my truant steps across the lawn:
> Unheard the shout that rent the noontide air,
> When the slow dial gave a pause to care.
> Up springs at every step, to claim a tear,
> Some little friendship formed and cherished here;
> And not the lightest leaf but trembling teems
> With golden visions and romantic dreams.

CHAP. VII.

PROPOSITIONS.

All truth and all error lie in Propositions.—J. S. Mill.

In accordance with that experience which directs us to the profoundest books for the simplest statements, we turn to Mill's Logic for the philosophy of propositions. The answer to every question which it is possible to frame is contained in a proposition or assertion. Whatever can be an object of belief or even of disbelief, must, when put into words, assume the form of a proposition. * * What we call a truth is simply a true proposition; and errors are false propositions. To know the import of all possible propositions would be to know all questions which can be raised, all matters which are susceptible of being either

* Beauties and Uses of Euclid, pp. 47-8.

believed or disbelieved. * * Since then the objects of all belief and all inquiry express themselves in propositions, a sufficient scrutiny of propositions and of their varieties will apprise us what questions mankind have asked themselves, and what is the nature of the answers to those questions they have actually thought they had grounds to believe.

'Now the first glance at a proposition shows that it is formed by putting together two names. A proposition, according to the common simple definition, which is sufficient for our purpose, is, *discourse in which something is affirmed or denied of something.* Thus, in the proposition, gold is yellow, the quality *yellow* is affirmed of the substance *gold*. In the proposition, Franklin was not born in England, the fact expressed by the words *born in England* is denied of the man Franklin.

'Every proposition consists of three parts: the subject, the predicate, and the copula. The predicate is the name denoting that which is affirmed or denied. The subject is the name denoting the person or thing which something is affirmed or denied of. The copula is the sign denoting that there is an affirmation or denial; and thereby enabling the hearer or reader to distinguish a proposition from any other kind of discourse. Thus, in the proposition, the earth is round, the predicate is the word *round*, which denotes the quality affirmed, or (as the phrase is) predicated: *the earth*, words denoting the object which that quality is affirmed of, compose the subject; the word *is*, which serves as the connecting mark between the subject and predicate, to show that one of them is affirmed of the other, is called the copula.'

CHAP. VIII.

DEFINITIONS.

No difficulty is unsurmountable, if words be allowed to pass without meaning.—LORD KAMES.

As every proposition consists of two names, and as every proposition affirms or denies one of these names of the other, the value of definition, which fixes the import of names, is apparent.

'A *name* is a word taken at pleasure to serve for a mark, which may raise in our mind a thought like to some thought we had before, and which being pronounced to others, may be to them a sign of what thought the speaker had before in his mind [Hobbes]. This simple definition of a name, as a word (or set of words) serving the double purpose of a mark to recall to ourselves the likeness of a former thought, and a sign to make it known to others, appears unexceptionable.'*

Definition originates in accurate and comprehensive observation. 'There cannot be,' says Mill, 'agreement about the definition of a thing, until there is agreement about the thing itself. *To define a thing is to select from among the whole of its properties those which shall be understood to be designated and declared by its name;* and the properties must be very well known to us before we can be competent to determine which of them are fittest to be chosen for this purpose.'†

'The simplest and most correct notion of a definition is, a proposition declaratory of the meaning of a word; namely, either the meaning which it bears in common acceptation, or that which the speaker or writer, for the particular purposes of his discourse, intends to annex to it.'‡

But with most persons the object of a definition is merely to guide them to the correct use of a term as a protection against applying it in a manner inconsistent with custom and convention. Anything, therefore, is to them a sufficient definition of a term which will serve as a correct index to what the term denotes; although not embracing the whole, and sometimes perhaps not even any part of what it connotes.

Definitions are sometimes explained as being of two kinds—of things and words.

The definition of *words* is the explanation of the sense in which they are used.

The definition of *things* is an explanation of the specific properties by which they differ from all other things.

To define a thing, says Dr. Watts, we must ascertain with what it agrees, then note the most remarkable attribute of difference, and join the two together.

* J. Stuart Mill: System of Logic, 2nd ed., chap. 11, sec. 1, p. 27.
† Introduction to Logic, p. 1.
‡ Mill's Logic, p. 182, vol. 1.

Probity—the disposition to acknowledge the rights of mankind.
Justice—the disposition to maintain the rights of mankind.
Benevolence—the disposition to improve the rights of mankind.
Deceit—the concealed violation of the rights of mankind.
Injustice—the open violation of the rights of mankind.
Malevolence—hatred of the rights of mankind.

In defining a word we seek some class to which to refer it, that we may identify it, and fix attention upon that peculiarity by which we can distinguish it from all other things. 'Probity and 'justice' are referred to 'disposition,' with reference to the 'rights of mankind' as their sphere of existence: and *acknowledgment*, and *maintenance*, are mentioned as the distinguishing features.

Distinctions must not be made without differences. The definition should be plainer than the thing defined. Aristotle's definition of motion is considered defective in this respect:—'Motion—an act of a being in power, so far forth as it is in power.' Tautological definitions cause more to be supposed than is true—the too terse explanation leaves some necessary thing unmentioned. A perfect definition requires the union of the concise, the clear, and the adequate. Some persons are so unskilful in the analysis of terms as to occasion the advice *Nil explicare*—never explain yourself if you wish to be understood.

Double meanings should be avoided. The writer may himself alternate in their use, and the reader may take the word in the unintended meaning. All men have not the strong sense of Johnson. When Caleb Whitefoord inquired seriously of the Doctor, whether he really considered that a man ought to be transported, like Barrington, the pickpocket, for being guilty of a double meaning. 'Sir,' said Johnson, 'if a man means well, the more he means the better'—which, whether real or fictitious, is one of the happiest answers that ever crushed a quibble.*

I have frequently put the question—What is consciousness? to persons who have been conscious for twenty or thirty years, but who were yet unable to reply. Had any one deprived these persons of consciousness, a judge would have hanged him for the offence; yet, could they themselves have been interrogated as to what harm they had suffered, they could not have told

* Hood's Own.

what they had lost. And upon the principle, that he not knowing what he has lost, is no loser, those persons, though murdered, had suffered no harm.

The various definitions of the same subject which prevail, originate in the caprice, or partial, or profound knowledge the definer may have of his subject. It seems to be admitted by logicians, that an author has a right to give whatever provisional definition he pleases of his terms. But having once given them, perspicuity requires that he should adhere to them. Any new sense in which a term is employed should be specially defined. In discoursing on an ordinary subject, as the right of public assembly, such words as perception, conception, apprehension, might be used reciprocally, but in a dissertation on metaphysics each requires restriction in use and precision in purport.

Often genius strikes out new relations of words. In recent political debates, Mr. Cobden resorted with new force and point to a charge of rashness against ministers: he showed that rashness consisted more frequently in inaction than action. He is rash who stands surrounded by the elements of danger without taking any precaution against the contingencies of peril; he is rash who does not take advantage of the calm to repair his shattered rigging; he is rash who looks not out for a proper supply of water until the conflagration is raging around him; and more rash than all is he who exercises no provident care for supplying a nation with food, but waits for the pressure of famine and the perils of starvation.

At the last soirée of the Leeds Mechanics' Institution, Mr. Dickens referred to ignorance, commonly considered as a passive negation, and placed it in the light of a power. 'Look where we will, do we not find ignorance powerful for every kind of wrong and evil? Powerful to take its enemies to its heart and strike its best friends down—powerful to fill the prisons, the hospitals, and the graves—powerful for blind violence, prejudice, and error in all their destructive shapes.'

The variations which not only common but technical terms undergo, is a considerable source of perplexity in reasoning. Mr. Mill cites the instance of the term felony. No lawyer will undertake to tell what a felony is otherwise than by enumerating the various kinds of offences which are so called. Originally, felony denoted all offences, the penalty of which included forfei-

ture of goods; but, subsequent Acts of Parliament have declared various offences to be felonies without enjoining that penalty, and have taken away the penalty from others which continue still to be called felonies, insomuch that the acts so called have now no property whatever in common, save that of being unlawful and punishable. This inattention to precision in terms has arisen not among the vulgar, but among educated English lawyers.

'Language,' says Mr. Mill, borrowing a political similie from Sir James Mackintosh, '"is not made, but grows." * * A name not unfrequently passes by successive links of resemblance from one object to another, until it becomes applied to things having nothing in common with the first things to which the name was given; which, however, do not, for that reason, drop the name; so that it at last denotes a confused huddle of objects, having nothing whatever in common; and connotes nothing, not even a vague and general resemblance. When a name has fallen into this state, in which by predicating it of any object we assert literally nothing about the object, it has become unfit for the purposes either of thought or of the communication of thought; and can only be made serviceable by stripping it of some part of its multifarious denotation, and confining it to objects possessed of some attributes in common, which it may be made to connote. Such are the inconveniences of a language which "is not made, but grows." Like a road which is not made, but has made itself, it requires continual mending in order to be passable.'*

It is well observed, that the spontaneous growth of language is of the utmost importance to the thinker. There seems to be so palpable a substratum of right sense, in the rude classifications of the multitude, that the logician has little else to do, in many cases, than to retouch them and give them precision. Guizot observes, there is frequently more truth in common acceptations of general terms than in the more precise definitions of science. Common sense gives to words their ordinary signification. The leading terms of philosophy are clothed in innumerable shades of meaning acquired in their transitional use, and immense is the knowledge of *things* requisite to enable a man to affirm that any given argument turns wholly on *words*. The study of terms, for which logicians have provided multiplied means, is one of the

* Logic, p. 207.

most interesting and profitable upon which men can enter. If it be worth while to speak at all, it is worth while to know certainly what we speak about.

Philanthropic genius has pointed out a perversion of power, arising through definitional incapacity, which makes it a moral duty to study analysis of terms, and exactitude of expression.

'All battle,' says Carlyle, 'is *misunderstanding*—did the parties know one another, the battle would cease. No man at bottom means injustice; he contends for some distorted image of right. *Clear*, undeniable right—*clear*, undeniable might—either of these, once ascertained, puts an end to battle. Battle is a confused experiment to ascertain these.'

Of the power of names to impose on the multitude, history furnishes too many examples. Strength to forefend us against their delusion—ability to see that the meaning governs the term, and not the term the meaning—are species of intellectual self-defence. 'Augustus,' says Gibbon, 'was sensible that mankind is governed by names; nor was he deceived in his expectation that the senate and people would submit to slavery provided that they were respectably assured that they still enjoyed their ancient freedom.' 'Never,' adjures W. J. Fox, 'be deceived by words. Always try to penetrate to realities. Have your wits sharpened, your senses exercised to discern good and evil. Be not imposed upon by pompous manners. Many a solemnly-uttered sentence is often a sheer inanity, which will not bear the scrutiny of an observant intellect. Be not frightened by denunciations; by being told that you are not a good subject or a good Christian, if you do not believe, or say that you believe this or that. Be not led astray by iteration—mistake not the familiar for the intelligible. Ascertain what words are meant to convey, and what they actually do convey. Go to the substance and soul of whatever is propounded. Be on your guard against bold assumptions, nor let them bear you away against the dictates of your own understanding. Look at phrases as counters, or paper money, that may pass for much or little according to circumstances. Endeavour to arrive at truth, and make that your treasure. Be ever wide awake to see through any veil of sophistry and cant; nor by the agency of words be made the dupe of critic or lawyer, of priest or politician.'*

* Lectures to the Working Classes, p. 70, vol. 2.

CHAP. IX.

SYLLOGISMS.

PROPOSITIONS being assertions—as soon as sufficient reasons are adduced to make the proposition credible, it becomes a truth probable or certain, as the case may be.

Reasoning is a simple business. To reason is to state facts in support of a proposition. A conclusive fact so advanced is called a reason. All the reasons offered in proof of a proposition are called premises. The Pythagorean, who lays down the proposition that fruits and grain are the proper food of man, and cites facts to prove his assertion—reasons. A proposition and its reasons are called an argument.

Reason is the faculty of perceiving coherences. Effective reasoning is stating them so that others cannot but see them too. 'Reasoning on the abstrusest questions is nothing more than arriving at a remote truth by discovering its coherence with the preceding facts in the same chain.'*

A syllogism is a peculiar *form* of expression, in which every argument may be stated. It consists of three propositions.

1. Whoever have their heads cut off ought to be allowed to ask the reason why.

2. Women have their heads cut off.

3. Therefore women ought to be allowed to ask (politically) the reason why.

This is an argument of Mad. de Stael, in allusion to the beheading of women in France, without allowing them any voice in making the laws which determine the offences for which they suffered.

A syllogism is constructed upon the principle (known as the Dictum of Aristotle) that whatever is affirmed or denied universally of a whole class of things, may be affirmed or denied of anything comprehended in that class. Thus the first proposition introduces the class of persons who have their heads cut off. Of this class it is affirmed that they ought to be allowed to ask the reason why. But women are included in the class of persons who have their heads cut off, and consequently that may be affirmed of them which is affirmed of the whole class—that they should be allowed to ask the reason why.

* Uses and Beauties of Euclid, p. 52.

'To prove an affirmative,' says Mr. Mill, 'the argument must admit of being stated in this form:—

All animals are mortal;
All men / Some men / Socrates } are animals;
therefore
All men / Some men / Socrates } are mortal.

'To prove a negative, the argument must be capable of being expressed in this form:—

'No one who is capable of self-control is necessarily vicious;
All negroes / Some negroes / Mr. A.'s negro } are capable of self-control;
therefore
No negroes are / Some negroes are not / Mr. A.'s negro is not } necessarily vicious.

'Although all ratiocination admits of being thrown into one or the other of these forms, and sometimes gains considerably by the transformation, both in clearness and in the obviousness of its consequence; there are, no doubt, cases in which the argument falls more naturally into one of the other three figures, and in which its conclusiveness is more apparent at the first glance in those figures, than when reduced into the first. Thus, if the proposition were that pagans may be virtuous, and the evidence to prove it were the example of Aristides; a syllogism in the third figure,

Aristides was virtuous,
Aristides was a pagan,
therefore
Some pagan was virtuous,

would be a more natural mode of stating the argument, and would carry conviction more instantly home, than the same ratiocination strained into the first figure, thus—

Aristides was virtuous,
Some pagan was Aristides,
therefore
Some pagan was virtuous.'*

The best thing that can be said in favour of the syllogism, as an instrument of reasoning, is that it is a regular form to which every valid argument can be reduced; and may be accompanied by a rule, showing the validity of every argument in that form, and consequently the unsoundness of any apparent argument which cannot be reduced to it. This would be high praise if every 'valid argument' was a trusty one. But unfortunately 'the question respecting the validity of an argument is not whether the conclusion be *true*, but whether it *follows* from the premises adduced.'† Even this small advantage is purchased at a greater expense of tedium and trouble than the bulk of mankind are willing to pay, or able to pay if they were willing.

There is some reason to believe that the syllogistic form, as a *test* of valid arguments, may be entirely dispensed with, if we can secure accuracy of data, and intelligibility in terms.

It is not contended now that we discover new truths by the syllogism. The syllogism is allowed to be only a form of *stating* a truth. Example:—

No predacious animals are ruminant.
The lion is predacious,
therefore
The lion is not ruminant.

Of course, if we know that no animal that lives by prey chews the cud, and know, also, that the lion lives by prey, we know that the lion does not chew the cud. This conclusion, as Lord Kames contends, and Dr. Whately admits, is not a truth *inferred* from the fundamental premises, but *included* in it. Smart, whom Mr. J. S. Mill calls acute and often profound, remarks—'Every one, as to the *mere* act of reasoning; *reasons rightly*: we may reason from wrong premises, or mistake right ones; we may be unable to infer from proper ones; but from such premises as we do reason from, we reason *correctly*: for all premises contain their conclusion; and in knowing the premises, we therefore know the

* Logic, vol. 1, pp. 232-3.
† Whately's Logic, Anal. Out., chap. 1, sec. 3.

conclusion. The art wanted is one that will enable us to use language perspicuously in expressing our premises:' and he might have added—*direct us in selecting proper materials of which to make premises.*

The strength and weakness of the syllogism as an instrument of reasoning will now be understood. Whately remarks, that 'since all reasoning may be resolved into syllogisms, and since in a syllogism the premises do virtually assert the conclusion, it follows at once that no new truth can be elicited by any process of reasoning.'* We therefore no longer look to the syllogism to discover truth, its value is in stating it. In this sense it is worthy of all attention. It is the form of nature.

Of such a syllogism as the one quoted—

No predacious animals are ruminant,
The lion is predacious,
therefore
The lion is not ruminant,

it has been insisted by some logicians that the genius required for its construction was *invention*. Having made a general proposition like the first, we then have to invent or find out a middle term as the second—but if we bear in mind that the general affirmation of the first proposition relates to a class of (predacious animals in this case) objects which include the middle term, the necessity of invention is consequently dispensed with. We need only look well to what we have there. Simplicity will be promoted by returning to our previous remark, viz.—that reasoning is asserting a proposition, and then showing why it is true—in other words, adducing the fact or facts, on which the assertion rests.

In the Logic given in 'Chambers' Information,' it is said—'In choosing your middle terms, or arguments to prove any question, always take such topics as are purest and least fallible, and which carry the greatest evidence and strength with them.' But it rather appears that we have not to invent a middle term, but only to look to the major premises, and find it included there.

By methodical questioning any argument may be tested. Thus, on any assertion being made, ask—Why is the assertion true? In this manner, if an argument has truth in it, it may be elicited. In this manner you dig through assertions down to premises, and discover whether any ore of truth lies there.

* Logic, p. 223.

The value of the argument depends upon the final answer which reveals the premises or data of facts, upon which the conclusion rests. Forms of speech, classification of propositions, figures of syllogisms, are of minor importance when you have once elicited the rough truth. The best test of an argument is the soundness of its data, and the simplest formula for drawing out and exhibiting such data, is of the greatest service in enabling us to judge of the validity thereof.

Tyranny, says Cobbett, has no enemy so formidable as the pen. Why? 'Because the pen pursues tyranny both in life and beyond the grave.' How is this proved to be the most formidable enemy of tyranny? 'From the fact that tyranny has no enemy so formidable as that which assails not only its existence, but its reputation, which pursues it in life and beyond the grave.' Such interrogatories and replies generate the expository syllogism.

1. Tyranny has no enemy so formidable as that which assails not only its existence, but its reputation, which pursues it in life and beyond the grave.
2. The pen pursues tyranny in life and beyond the grave.
3. Therefore, tyranny has no enemy so formidable as the pen.

A syllogism is made up of collective and single facts. It is the process of reasoning, whereby we show that a single truth is proved by a collective one which contains it, or a less quantity is proved by a greater, or that an assertion is proved by an induction from a class of facts. From the class of the enemies of tyranny the pen is selected, and is proved, by passing in inductive review the whole class, to be the most formidable.

The usual manner in which an argument is presented is called the enthymeme. Thus:—

He is an industrious man,
therefore
He will acquire wealth.

The first or major proposition is in this form suppressed. The syllogistic form would be this:—

Every industrious man acquires wealth,
He is an industrious man,
therefore
He will acquire wealth.

But if we ask for the proof that every industrious man acquires wealth, we find the facts wanting—for the idle are often rich,

and the diligent poor. The industrious *may* acquire wealth, the chances are in their favour.

Again. We must cherish self-respect,
Because self-respect is the stay of virtue.

The suppressed proposition is—'We must cherish whatever is the stay of virtue.'

The whole syllogism then stands thus:—

We must cherish whatever is the stay of virtue,
Self-respect is the stay of virtue,
therefore
We must cherish self-respect.

Dilemma is derived from a Greek word, and signifies twice an argument. It is an argument divided into several members, and infers of each part what is to be inferred of the whole. Thus: Either we shall live or die. If we live, we can only live happily by being virtuous; and if we die, we can only die happy by being virtuous; therefore, we ought always to be virtuous. In the dilemma, question one argument at a time, as in preceding cases.

The Sorites uses several middle terms by which the predicate of the last proposition is connected with the first subject. Of this argument the well-known speech of Themistocles is a specimen. 'My son,' said that eminent person, 'governs his mother, his mother governs me, I govern the Athenians, the Athenians govern Greece, Greece governs Europe, and Europe governs the world; therefore, my son governs the world.' In these instances, question each assertion, as there are as many acts of reasoning as intermediate propositions.

The Onus Probandi, or Burden of Proof, is said to rest with him who would dispute any point in favour of a presumptive, or generally allowed truth. But manly logic holds no quibbling about who shall prove. Whatever he asserts, the honest reasoner should be prompt to prove.

Chalmers, it is said, made Morell known—but Morell has written a synopsis of metaphysical philosophy that only needed to be known to be appreciated. If Chalmers gave Morell distinction, Morell had previously earned it. From his work I extract the following passage, which passes in review the steps taken, marks the analytic point reached, and outlines the ground before us: —'Different as were the minds of those two great men [Bacon and Descartes] in themselves, different as were their respective

labours, and opposite as were, in many respects, the results at which they arrived, yet the writings of both were marked by one and the same great characteristic, namely, by the *spirit of method*. The most important works of Bacon, it will be remembered, were the "Instauratio Magna," and the "Novum Organum;" those of Descartes were his "Dissertatio de Methodo," and his "Meditationes de Primâ Philosophiâ." The fruitlessness of the ancient logic, as an instrument of discovery, had been abundantly proved by past experience, and the watchword which these two great thinkers of their age both uttered, and which has been ever since the guiding principle of all philosophy, was—ANALYSIS. Bacon, who gave his attention chiefly to the direction and improvement of physical science, taught to analyse nature, while Descartes, who aimed rather at grounding all human knowledge upon its ultimate principles, instructed how to analyse *thought*. All modern philosophy, therefore, whether it arise from the Baconian or the Cartesian point of view, bears upon it the broad outline of the analytic method. It matters not whether it be the outer or the inner world to which its investigations apply, in each case it teaches us to observe and analyse *facts*, to induce instances, and upon such observation and induction to ground our knowledge of laws and principles. In this alone consists the unity of modern science, and from this arises its broad distinction from that of the ancient world. Every natural philosopher since Bacon has grounded his success upon an induction of the facts of the outward world, and every metaphysician, since Descartes, has progressed onwards in his department of knowledge by analysing the facts of our inward consciousness."*

CHAP. X.

INDUCTION.

INDUCTION is an inference from many facts. Induction is verification. Just as in a syllogism we show that a part is contained in the whole, so in induction we show that a part is illustrated by the whole. It seems that every single fact contains many truths, but

* Morell: Modern Philosophy, pp. 76-8.

Induction establishes their *universality*. A single brain contains all the truths of phrenology, a single stone includes the phenomena of gravitation, the temperance of a single individual exhibits the whole law of moderation, but we learn the universality of these truths by induction

Every legal statute, says Dr. Johnson, is founded on induction. 'Law is the science in which the greatest powers of understanding are applied to the greatest number of facts.' The *basis of all* science is such an extensive induction of particulars as leads to general definitions and fundamental axioms, and furnishes the premises from which inferences may be deduced.

Inductive observation is the great instrument of discovering important truths. 'What are called the principles of human nature are learned from individual instances. It is the only possible way of learning them. * * When we reason from a general law or principle, we are in truth reasoning from a number of instances represented by it.'*

A general election is an induction of the intelligence of the country represented by the members of Parliament. The difference between democracy and monarchy is in one sense an affair of logic. Where electors are limited in franchise, and candidates restricted by property qualification, the induction is partial, but where all can vote and many can be chosen from, the premises are more capacious and the inference sounder.

Dr. Whately says, that 'in Natural Philosophy a *single instance* is often accounted a *sufficient* induction; *e.g.*, having once ascertained that an individual magnet will attract iron, we are authorised to conclude that this property is universal.'

'The Edinburgh Reviewer of Whewell's "History of the Inductive Sciences," observes that, "by the *accidental* placing of a rhomb of calcareous spar, upon a book or line, Bartholinus discovered the property of the double refraction of light. By *accidentally* combining two rhombs in different positions, Huygens discovered the polarisation of light. By *accidentally* looking through a prism of the same substance, and turning it round, Malus discovered the polarisation of light by reflection; and by placing thin chrystalline films between two similar prisms or rhombs, M. Arago discovered the phenomena of polarised tints."

* Rationale of Political Representation, p. 34.

'To this Mr. Whewell, in his "Philosophy of the Inductive Sciences," makes the following reply:—"But Bartholinus could have seen no such consequence in the accident, if he had not previously had a clear conception of single refraction. A lady, in describing an optical experiment which had been shown her, said of her teacher, 'he told me to increase and diminish the angle of refraction: and, at last, I found that he only meant me to move my head up and down.' At any rate, till the lady had acquired a knowledge of the meaning which the technical terms convey, she could not have made Bartholinus's discovery by means of this accident. Suppose that Huygens made the experiment alluded to, without design, what he really observed was that the images appeared and disappeared alternately as he turned the rhomb round. His success depended on his clearness of thought, which enabled him to perform the intellectual analysis which would never have occurred to most men, however often they had combined two rhombs in different positions. Malus saw that in some positions the light reflected from the windows of the Louvre became dim. Another person would have attributed this to accident; he, however, considered the position of the prism, and the window; repeated the experiment often; and by virtue of the eminently distinct conceptions of space which he possessed, resolved the phenomenon into its geometrical conditions."* "If it were true, that the fall of an apple was the occasion of Newton's pursuing that train of thought which led to the doctrine of universal gravitation, the habits and constitution of Newton's intellect were the real source of this great event in the progress of knowledge."† "In whatever manner facts may be presented to the notice of a discoverer, they can never become the materials of exact knowledge, except they find his mind already provided with precise and suitable conceptions, by which they may be analysed and connected."'‡

These admissions seem to me to prove that whenever a casual fact proves to us a new truth, it does so by its coincidence with previously known facts, and that the novelty of the occasion attracts all credit to itself, and we lose sight of the generalisation below—the fruitful soil of experience on which the new fact, like

* Whewell: Phil. Induct. Sciences, vol. 2, pp. 190-1.
† Ibid, vol. 2, p. 189.
‡ See J. N. Bailey's Essays, pp. 87-8-9.

a seed, falls. We only recognise difference by comparison, and the comparison is an induction, however slender.

Monsieur de Montmorine was recaptured and brought to the scaffold, through the trifling circumstance of some chicken bones being found near the door of his landlady—a woman too poor to indulge in such dainties.* The discovery of de Montmorine was not, as at first sight appears, an inference from a single fact, but from an adjacent induction. It was a general truth, (known to the party who observed the bones) a truth inducted from a number of facts that poor people could not afford to luxuriate on chickens. It was, therefore, from this induction, inferred that some one of superior fortune must be living in that particular place.

The judicious care which the great fathers of science have exhibited in making their inferences, incontestibly establishes their conviction of the danger of any other reasoning than that from inductions. Lord Brougham informs us, that what Newton's Principia is to science, Locke's essay to metaphysics, Demosthenes in oratory, and Homer in poetry, Cuvier's researches to our fossil osteology. But Cuvier never attempted to draw any inferences until he had examined the *whole* osteology of the living species.

Lord Brougham remarks, that 'from examining a *single* fragment of bone we infer that, in the wilds where we found it, there lived and ranged, some thousands of years ago, an animal of a peculiar kind.' This is a case in which the inference spoken of is arrived at in a way different from that apparently stated. We recognise in the 'fragment of bone' a link in a chain of facts constituting the basis of a well-known induction, which comparative anatomy has many times verified. It is important to distinguish well the grounds from which accurate inferences, such as these in the cases before us, have really been adduced, in order to ascertain the grounds from which we should reason generally. It will be found that solid reasoning can only proceed from general rules—*i.e.*, inductions from facts. It will be found that the prime source of fallacy lies in reasoning from isolated facts. It is not to be denied that such reasoning is sometimes right, but it is to be remembered that it is right by accident, not by design. There is no science or certainty in it. It is hazard, not logic.

* Chambers' Miscellany of Useful and Entertaining Tracts, No. 61: the Story of Lavalette, p. 27.

This habit however, is very common. Mr. Mill says, that 'Not only *may* we reason from particulars to particulars, without passing through generals, but we perpetually do so reason. All our earliest inferences are of this nature. From the first dawn of intelligence we draw inferences, but years elapse before we learn the use of general language. The child, who, having burnt his fingers, avoids to thrust them again into the fire, has reasoned or inferred, though he has never thought of the general maxim—fire burns. He knows from memory that he has been burnt, and on this evidence believes, when he sees a candle, that if he puts his fingers into the flame of it, he will be burnt again. He believes this in every case which happens to arise; but without looking, in each instance, beyond the present case. He is not generalising; he is inferring a particular from particulars. In the same way, also, brutes reason. There is little or no ground, for attributing to any of the lower animals the use of conventional signs, without which general propositions are impossible. But those animals profit by experience, and avoid what they have found to cause them pain, in the same manner, though not always with the same skill, as a human creature. Not only the burnt child, but the burnt dog, dreads the fire.

'I believe that, in point of fact, when drawing inferences from our personal experience, and not from maxims handed down to us by books or tradition, we much oftener conclude from particulars to particulars directly, than through the intermediate agency of any general proposition. We are constantly reasoning from ourselves to other people, or from one person to another, without giving ourselves the trouble to erect our observations into general maxims of human or external nature. When we conclude that some person will, on some given occasion, feel or act so and so, we sometimes judge from an enlarged consideration of the manner in which men in general, or men of some particular character, are accustomed to feel and act; but much oftener from having known the feelings and conduct of the same man in some previous instance, or from considering how we should feel or act ourselves. It is not only the village matron who, when called to a consultation upon the case of a neighbour's child, pronounces on the evil and its remedy simply on the recollection and authority of what she accounts the similar case of her Lucy. We all, where we have no definite maxims to steer by, guide ourselves in

the same way; and if we have an extensive experience, and retain its impressions strongly, we may acquire, in this manner, a very considerable power of accurate judgment, which we may be utterly incapable of justifying or of communicating to others. Among the higher order of practical intellects, there have been many of whom it was remarked how admirably they suited their means to their ends, without being able to give any sufficient reasons for what they did; and applied, or seemed to apply, recondite principles which they were wholly unable to state. This is a natural consequence of having a mind stored with appropriate particulars, and having been long accustomed to reason at once from these to fresh particulars, without practising the habit of stating to oneself or to others the corresponding general propositions. An old warrior, on a rapid glance at the outlines of the ground, is able at once to give the necessary orders for a skilful arrangement of his troops; though if he has received little theoretical instruction, and has seldom been called upon to answer to other people for his conduct, he may never have had in his mind a single general theorem respecting the relation between ground and array. But his experience of encampments, under circumstances more or less similar, has left a number of vivid, unexpressed, ungeneralised analogies in his mind, the most appropriate of which, instantly suggesting itself, determines him to a judicious arrangement.

'The skill of an uneducated person in the use of weapons, or of tools, is of a precisely similar nature. The savage who executes unerringly the exact throw which brings down his game, or his enemy, in the manner most suited to his purpose, under the operation of all the conditions necessarily involved, the weight and form of the weapon, the direction and distance of the object, the action of the wind, &c., owes this power to a long series of previous experiments, the results of which he certainly never framed into any verbal theorems or rules. It is the same in all extraordinary manual dexterity. Not long ago a Scotch manufacturer procured from England, at a high rate of wages, a working dyer, famous for producing very fine colours, with a view of teaching to his other workmen the same skill. The workman came; but his mode of proportioning the ingredients, in which lay the secret of the effects he produced, was by taking them up in handfuls while the common method was to weigh them. The manufacturer

sought to make him turn his handling system into an equivalent weighing system, that the general principle of his peculiar mode of proceeding might be ascertained. This, however, the man found himself quite unable to do, and therefore could impart his skill to nobody. He had, from the individual cases of his own experience, established a connection in his mind between fine effects of colour, and tactual perceptions in handling his dyeing materials; and from these perceptions he could, in any particular cases, infer the means to be employed, and the effect which would be produced, but could not put others in possession of the grounds on which he proceeded, from having never generalised them in his own mind, or expressed them in language.

'Almost every one knows Lord Mansfield's advice to a man of practical good sense, who, being appointed governor of a colony, had to preside in its court of justice, without previous judicial practice or legal education. The advice was to give his decision boldly, for it would probably be right; but never to venture on assigning reasons, for they would almost infallibly be wrong. In cases like this, which are of no uncommon occurrence, it would be absurd to suppose that the bad reason was the source of the good decision. Lord Mansfield knew that if any reason were assigned it would be necessarily an afterthought, the judge being *in fact* guided by impressions from past experience, without the circuitous process of framing general principles from them, and that if he attempted to frame any such he would assuredly fail. Lord Mansfield, however, would not have doubted that a man of equal experience, who had also a mind stored with general propositions derived by legitimate induction from that experience, would have been greatly preferable as a judge, to one, however sagacious, who could not be trusted with the explanation and justification of his own judgments. The cases of able men performing wonderful things they know not how, are examples of the less civilised and most spontaneous form of the operations of superior minds It is a *defect in them*, and *often a source of errors*, not to have generalised as they went on; but generalisation is a help, the most important indeed of all helps, yet not an essential.'*

In illustration of generalising from single instances, Miss Martineau gives this example:—'A raw Chinese traveller in England was landed by a Thames waterman who had a wooden leg. The

* Mill's Logic, pp. 251-5.

stranger saw that the wooden leg was used to stand in the water with, while the other was high and dry. The apparent economy of the fact struck the Chinese; he saw in it strong evidence of design, and wrote home that in England one-legged men are kept for watermen, to the saving of all injury to health, shoe, and stocking, from standing in the river.'*

Reasoning on insufficient data—

Falls like an inverted cone,
Wanting its proper base to stand upon.

Samuel Bailey has furnished, in one passage, both a clear illustration of the process, and the validity of an induction:—'Whoever had witnessed the acts of a landlord to his tenants, of a schoolmaster to his pupils, of artizans towards their apprentices, of husbands towards their wives, on points where the power of the superior could not be contested, and where his personal gratification was incompatible with just conduct to the subordinate, would necessarily have formed in his own mind a species of general rule; and from this rule he might safely draw an inference as to what would be the conduct of a despot, seated on a throne, in the possession of unchecked authority; assisted too, as the inquirer would be, by that *indispensable and inestimable guide to the knowledge of mankind, an appeal to his own feelings*, in a variety of *analogous* instances.

'We conclude, that a ruler with uncontrolled power will act the tyrant, not merely from the fact that Caligula, or Nero, or Bonaparte did, but from a thousand facts attesting that men, in every situation, use uncontrolled power in this way—just as we infer that all bodies tend to the centre of the earth, *not merely from the circumstance of an apple dropping from a tree*, BUT *from seeing the tendency in stones, water, animals, and all things within our observation.* The use of uncontrolled power, for the gratification of the possessor, without an equitable respect to others, is no more peculiar to monarchs, than a tendency to the earth is peculiar to apples. It may be useful to know that *monarchs* act in this way, as it may be useful to know that apples drop to the ground; but it is much more useful to know that *men* act in this manner. *An inference is safer when gathered from the widest induction.*'†

* How to Observe, p. 6.

† Rationale of Political Representation. Introduction, pp. 25-6. The last sentence of this extract is abridged—but, as the reader will find upon reference, the sense of the author is faithfully rendered.

It may be useful to observe that, though a few instances are insufficient to establish a theory, one may be sufficient to overturn a theory, fancifully or hypothetically supported. Gibbon overturns the entertaining theory of Rudbeck, an antiquarian of Upsal, of profound learning and easy faith, who, by the dim light of legends and traditions, of conjectures and etymologies, sought to establish the antiquity of Sweden over half the earth. Gibbon annihilated this well laboured system of German antiquities, by a single fact too well attested to admit of any doubt, and of too decisive a nature to leave room for any reply—the fact that the Germans, of the age of Tacitus, were unacquainted with the use of letters. A circumstance fatal to their literary claims, urged by Olaus Rudbeck.

In the chapter on 'Facts' I have cautioned the reader against unquestioned data. This seems the place to remark that the unsuspected sources of error and unfriendliness have their rise in the criminal implicitness with which we listen to reports, and infer from rumours as from facts. These are the 'very little handles which move men and women to strange performances.'* All the plots of dramas and romances are founded on misunderstandings, which a little sagacity of action (such as a wise resolution not to be imposed upon would lead to) would commonly suffice to arrest the error at its birth. With regard to character we constantly infer from data, partial, limited, and doubtful. If most quarrellers were called into a court of Inquiry to confess the real grounds from which they have arrived at certain conclusions with regard to their neighbours, and often with regard to their friends, they would be at once overwhelmed with a conviction of the weakness of which they have been guilty. Upon analysing the miserable sources of opinions of which scandal and calumny are born, I have found it impossible to restrain astonishment at the imbecility of logical power men will sometimes be content to exhibit, where meanness prevails, malice incites, and passion governs. Well might Bacon exclaim—'Doth any man doubt, that if there were taken out of men's minds, vain opinions, flattering hopes, false valuations, imaginations, and the like, but it would leave the minds of a number of men poor shrunken things?'† The wise rule is, never

* Cricket on the Hearth.
† Essay on Truth.

judge from appearances when facts can be had—never receive a report without challenging its foundation, nor adopt it without permission to give the authority.

In all cases, in which you must judge from appearances and reason from conjectures, adopt the *fairest* interpretation possible. On this principle, credit will sometimes be given where none is due—but in nine cases out of ten, justice will be done, for I am satisfied that there is more worth among men than wisdom, and that we do well much oftener than we reason well. We seldom need judge charitably, did we always endeavour to judge justly. But we make a virtue of our own errors, and we often affect to *condescend* to pronounce an opinion, which it would be criminal to withhold. If ever I go to the Herald's office, the motto I will have emblazoned shall be this—JUSTICE IS SUFFICIENT. Could we only get justice in the world, we could afford to excuse it all its 'charity' of judgment, and its benevolence even of act.

Where should a man's reputation be safe from suspicion if not in the hands of his friend? It ought to be a principle of action with all men, never to judge a friend except out of his own mouth. 'There was a generous friend of mine once, who never would have judged me or any other man unheard.'* With the sublime intensity of one who felt the infinite value of private justice, has Schiller delineated this spirit in the interview between Octavio and his son Max Piccolomini. After a violent and visible struggle with his feelings—wrought upon by his father's endeavours to sow suspicions in his mind, and detach him from the service of his friend, Wallenstein—Max exclaims:—

I will procure me light a shorter way.
Farewell.

Octavio. Where now?

Max. To the Duke.
If thou hast believed that I shall act
A part in this thy play——
Thou hast miscalculated on me grievously.
My way must be straight on. True with the tongue,
False with the heart—I may not, cannot be:
Nor can I suffer that a man should trust me—
As his friend trust me—and then lull my conscience
With such low pleas as these:—"I ask him not—
He did it all at his own hazard—and

* Edward to Mr. Peerybingle.

My *mouth* has never lied to him."—No, no
What a friend takes me for, that I must be.
—I'll to the Duke; ere yet this day is ended
Will I demand of him that he do save
His good name from the world, and with one stride
Break through and rend this fine-spun web of yours.
He can, he will!—*I* still am his believer.
Yet I'll not pledge myself, but that those letters
May furnish you, perchance, with proofs against him.
How far may not this Tertsky have proceeded—
What may not he himself too have permitted
Himself to do, to snare the enemy,
The laws of war excusing? Nothing, save
His own mouth shall convict him—nothing less!
And face to face will I go question him.
Ay—this state-policy? O how I curse it!
You will some time, with your state-policy,
Compel him to the measure; it may happen
Because ye are *determined* that he is guilty,
Guilty ye'll *make* him. All retreat cut off,
You close up every outlet, hem him in
Narrower and narrower, till at length ye force him—
Yes, *ye*,—ye *force* him in his desperation,
To set fire to his prison. Father! father!
That never can end well—it cannot—will not!
Deem of it what thou wilt; but pardon me,
That I must bear me on in my own way.
All must remain pure betwixt him and me;
And, ere the day-light dawns, it must be known
Which I must lose—my father, or my friend.*

Had Othello been thus honourable to Desdemona, he would never have murdered her. Incalculable is the evil we bring on ourselves and society, by supposing and surmising facts we ought resolutely to question. The motto of the garter—

Evil be to him who evil thinks,
ought to be,
Evil *is* to him who evil thinks.

Every man will be his own Lawyer and his own Doctor, and such is the perversity of human nature, he will also be his own *Iago*, and feed himself with suspicions. Nearly all tragedies hinge on this error.

To avoid being the cause of misunderstanding to others, it is a good rule never to speak critically of others, except in their pre-

* Schiller's Piccolomini, act 2 scene 2.

sence, or in print. When I am obliged to do this in conversation, with persons of unknown or doubtful exactitude, I take care to keep much below the truth in matters of censure, as anything of that kind may gain ten or twenty per cent. in carriage. When with men of just habits of interpretation, I pay them the highest compliment of friendship, and speak to them of others, without reserve.

Notorious are the contumelies put upon the cases of grievance presented from the people in the House of Commons. Nor is it altogether causeless. So prone are the ignorant to mistake their prejudices for facts, and ascribe to others as crimes what exists only in their own surmises, that most popular cases may be stripped of half their pretensions without injuring their truth. Exaggeration is the vice of ignorance. Half the speeches addressed to 'King Mob' are hyperbolic. The sentiments of public meetings minister too often to the prevalent inflation. The people will be powerful when they learn to be exact—and not till then.

The only mode of correcting this evil is to instil into the people the wise rule of Burlamiqui. To reason, (that is, inductively) says this writer, is to calculate, and as it were draw up an account, after balancing all arguments, in order to see on which side the advantage lies. Burlamiqui had law chiefly in view in his remark, but the rule is of immense application. A logician is a secretary or banker's clerk, who keeps an account between truth and error. When a lady once consulted Dr. Johnson on the degree of turpitude to be attached to her son's robbing an orchard—'Madam,' said Johnson, 'it all depends upon the weight of the boy. I remember my schoolfellow, Davy Garrick, who was always a little fellow, robbing a dozen orchards with impunity, but the very first time I climbed up an apple tree, for I was always a heavy boy, the bough broke with me, and it was called a judgment. I suppose that is why Justice is represented with a pair of scales.' This may not be the precise reason why Justice has a pair of scales, but the point goes to the root of the matter. Without weighing there can be neither justice nor fair induction.

In illustration of these views Mr. Mill has some able remarks:—'In proportion to any person's deficiency of knowledge and mental cultivation, is generally his inability to discriminate between his inferences and the perceptions on which they were grounded.

Many a marvellous tale, many a scandalous anecdote, owes its origin to this incapacity. The narrator relates, not what he saw or heard, but the impression which he derived from what he saw or heard, and of which perhaps the greater part consisted of inference, though the whole is related not as inference but as matter-of-fact. The difficulty of inducing witnesses to restrain, within any moderate limits, the intermixture of their inferences with the narrative of their perceptions, is well known to experienced cross-examiners; and still more is this the case when ignorant persons attempt to describe any natural phenomenon. "The simplest narrative," says Dugald Stewart, "of the most illiterate observer involves more or less of hypothesis; nay, in general, it will be found that, in proportion to his ignorance, the greater is the number of conjectural principles involved in his statements. A village apothecary (and, if possible, in a still greater degree, an experienced nurse) is seldom able to describe the plainest case, without employing a phraseology of which every word is a theory; whereas a simple and genuine specification of the phenomena which mark a particular disease—a specification unsophisticated by fancy, or by preconceived opinions, may be regarded as unequivocal evidence of a mind trained by long and successful study to the most difficult of all arts, that of the faithful *interpretation* of nature." *

It is in judgments formed, in reprehensible indifference to the actual facts of the case, that party rancour and the proverbial injustice of popular political opinion take their rise. A useful caution on this head is pronounced by Lord Brougham in his sketch of the life of Lord Wellesley:—'How often do we see,' observes his lordship, 'vehement and unceasing attacks made upon a minister or a statesman, perhaps not in the public service, for something which he does not choose to defend or explain, resting his claims to the confidence of his countrymen upon his past exertions and his known character. Yet these assaults are unremittingly made upon him, and the people believe that so much noise could not be stirred up without something to authorise it. Sometimes the objects of the calumny are silent from disdain; sometimes from knowing that the base propagators of it will only return to their slander the more eagerly after their conviction of falsehood; but sometimes, also, the silence may be owing to

* Logic, pp. 408-9, vol. 2.

official reserve, of which we see a most remarkable instance in the case of Lord Wellesley.'

Not only are enemies of the people afforded a justification for their opposition by wrongful judgment pronounced upon them, but the friends of the people often pass over to the other side through the same cause. When a leader of the people first comes in personal contact with the opposite party, and becomes acquainted with merits of feeling and judgment which he had as it were pledged himself to deny, and indeed achieved himself a position by disbelieving in, he becomes ashamed of the injustice exacted from him by his inexorable adherents, and forsakes his party when he should only forsake its errors. The case of Barnave, in the first French Revolution, is a memorable instance of this. On lesser theatres I have seen many instances of this kind of conversion. Such changes have always been ascribed to venality, yet they are men of generous instincts who are thus overcome—but they want logical strength, and cannot correct themselves without falling.

It is a wise rule in conversation, never to guess at meanings. When an observation is made, capable of affording two inferences, at once put the question which shall elicit the meaning intended. Conversation is held to no purpose unless explicitness comes out of it. Innumerable are the errors that arise through letting remarks pass, of which we only *suppose* we know the purport. This is a fruitful source of misunderstanding. When in Scotland I was much instructed by the intellectual characteristics of the people. The Scotch are essentially a reflective people. The English conceive doubts, but the Scotch put them into queries. Before I had been in the country many hours I was struck by the inductive habits of the people. A very old and illiterate woman, to whom I put an indefinite question, eyed me deliberately from head to foot before she gave me an answer. Not in rudeness did she gaze, so much as in inquiry as to what could be my object. I spent more than a week in inquiring at places, where apartments were to be let, by which I acquired profitable acquaintance with the people. Upon asking the terms of apartments, I was met, in all cases, by several preliminary questions, as for whom were they? what number of persons? what station, habits, and probable stay? Then I received the precise answer required. It did not seem to me that they were answering one question by

asking another, as is sometimes said of the Scotch—but by a happy and wise presence of mind they asked, as all should do, as many questions as were required to complete the data of the specific answer they were called upon to give.

A wise practice is followed in courts of law. No judge pronounces an opinion on a hypothetical case. What he would do? or what would be the judgment of the law, suppose a certain case should arise?—are questions he never condescends to answer. 'Bring the plaintiff into court, let the evidence be taken, and then we will decide. We sit here to judge actual, not suppositious cases.' Such would be the reply. People out of court might profit by the example.

I remember one striking instance of the pernicious effects of surmise. Some years ago I took part in a Fraternal Demonstration at Highbury Barn. The assembly was numerous, and composed of persons of all nations and all parties. The celebration was avowedly one of fraternity. The tone of the meeting reflected its object. Pacific words were on every tongue, and harmony reigned up till eleven o'clock. At that hour Monsieur Chillman asked me if some steps could not be taken to annualise the meeting, and he requested me to prepare and propose a resolution to that effect. Monsieur Chillman, thinking the resolution ought to come from an Englishman, strongly urged me to move it. I, thinking it too important to emanate from a young man, looked about for a person of experience and known discretion to introduce it. After several had declined, Mr. Hethering. ton undertook it. The English politicians were composed of two parties, the friends of Mr. O'Connor, and the members of the National Hall. At that time they were pleased to be the anti, podes of each other. No sooner had Mr. Hetherington spoken, he being the friend of Mr. Lovett, than his motion was supposed to come from Mr. Lovett's party, though they were utterly ignorant of its origination. Clamour's hundred tongues were loosened. Slumbering differences were awakened. Suspicion spread like an infection. Fraternity perished of the contagion. Twenty amendments were proposed, and it was not till midnight, and then in a storm indescribably contradictory of the meeting's whole purport, that a common understanding was come to. Had the least inquiry been made by the objecting party, previously to dissenting, they would have found that the suspicious proposition

originated with one of themselves. But assuming premises, they inferred from conjecture instead of fact, and raised disastrous doubts as to the ability of that assembly for domestic or international fraternisation.

The use and abuse of authority is a subject worthy of the young logician's serious attention. Many great writers like Bacon, through policy—Burke through position, or Shakspere through versatility of genius, have written on both sides of important questions. Such men, taken piece-meal, may be quoted by the most opposite parties in favour of the most opposite opinions. Unless there is time to make a broad induction from their writings, showing, by weighty, quantitive evidence, the side to which they leaned, better not quote them as *authorities* at all, but give what expresses your own views on your own responsibility—indeed, in *all cases*, the quoter ought to stand prepared, if possible, to justify all he cites from another in argument. 'There is perhaps something weak and servile in our wishing to rely on, or draw assistance from, ancient opinions. Reason ought not, like vanity, to adorn herself with old parchments, and the display of a genealogical tree; more dignified in her proceedings, she ought to derive everything from herself; she should disregard past times, and be, if I may use the phrase, the contemporary of all ages.'* Quote others as Grotius did: not as judges from whose decision there is no appeal, but as witnesses whose conspiring testimony confirms the view taken.

Analogy has frequently been confounded with induction. Analogy signifies reasoning from resemblances subsisting between phenomena—induction, reasoning from the sameness of phenomena.

The phenomena affording an induction of a law of nature must be obvious, uniform, and universal.

The rules to be observed in deducing general principles are, that the case be true and the facts universal.

On this subject, as exhibiting the clearest results arrived at, I transcribe a passage from Mill:—'There is no word which is used more loosely, or in a greater variety of senses, than analogy. It sometimes stands for arguments which may be examples of the most rigid induction. Archbishop Whately, for instance, following Ferguson and other writers, defines analogy conformably to

* Necker.

its primitive acceptation, that which was given to it by mathematicians, resemblance of relations. In this sense, when a country which has sent out colonies is termed the mother country, the expression is analogical, signifying that the colonies of a country stand in the same *relation* to her in which children stand to their parents. And if any inference be drawn from this resemblance of relations, as, for instance, that the same obedience or affection is due from colonies to the mother country which is due from children to a parent, this is called reasoning by analogy. Or if it be argued that a nation is most beneficially governed by an assembly elected by the people, from the admitted fact that other associations for a common purpose, such as joint stock companies, are best managed by a committee chosen by the parties interested; this, too, is an argument from analogy in the preceding sense, because its foundation is, not that a nation is like a joint stock company, or Parliament like a board of directors, but that Parliament stands in the same *relation* to the nation in which a board of directors stands to a joint stock company. Now, in an argument of this nature, there is no inherent inferiority of conclusiveness. Like other arguments from resemblance, it may amount to nothing, or it may be a perfect and conclusive induction. The circumstance in which the two cases resemble, may be capable of being shown to be the *material* circumstance; to be that on which all the consequences, necessary to be taken into account in the particular discussion, depend. In the case in question, the resemblance is one of relation; the *fundamentum relationis* being the management, by a few persons, of affairs in which a much greater number are interested along with them. Now, some may contend that this circumstance which is common to the two cases, and the various consequences which follow from it, have the chief share in determining all those effects which make up what we term good or bad administration. If they can establish this, their argument has the force of a rigid induction: if they cannot, they are said to have failed in proving the analogy between the two cases, a mode of speech which implies that when the analogy can be proved, the argument founded upon it cannot be resisted.'*

'Many of the most splendid and important discoveries in this science were the result of analogical reasonings. It was from

* Logic, pp. 97-8, vol. 2.

this source that Dr. Priestley proved the compound nature of atmospheric air; and it is related that it was in consequence of hints which he had given, when on a visit to Paris, to Lavoisier, founded entirely upon analogical conjectures, that the latter philosopher was induced to commence experiments, with the view of proving the compound nature of water, and of reducing it to its constituent elements. Indeed the whole history of this very important and useful department of human knowledge exhibits very striking and incontestible proofs how much of the art owed its existence to mere hints and conjectures, founded, in many cases, upon very slight resemblances or analogies.*

The chief province of analogy is confined to that of suggestion. Analogies are the great hinters of experiments. They illustrate an argument, but do not establish it. They are probabilities, not proofs. Hence Lord Brougham in one place exclaims:—'I have a dread, at least a suspicion, of all analogies, and never more than when on the slippery heights of an obscure subject; when we are, as it were, *inter apices* of a metaphysical argument, and feeling, perhaps groping, our way in the dark, or among the clouds. I then regard analogy as a dangerous light, a treacherous *ignis fatuus*.'†

A striking instance of the fallacy of analogy is afforded in the experiments of Professor Matteucci, which seem to prove that though the analogies between electricity and nervous substance are nearly perfect, yet they are two distinct agencies.‡

CHAP. XI.

DETECTION OF FALLACIES.

We hope to be able to save students from the fate of Diodorus, (a great logician, who died in his school through shame at being unable to resolve a quibble propounded by Stilpo)—not by hardening, but by enlightening them. Though we bring neither mood nor figure wherewith to test the presence of error, we are not without the hope of qualifying the student for its discovery.

* Blakey's Logic, pp. 96-7.
† Pal. Illus., vol. 2.
‡ See Zoist No. 20, p. 363.

It has been confessed from the throne of logic that, 'After all, in the practical detection of each individual fallacy, *much must depend on natural and acquired acuteness:* nor can any rules be given, the mere learning of which will enable us to *apply* them with mechanical certainty and readiness.'

Bulwer, in remarking that error is a view of *some* facts instead of a survey of *all*, indicated the key to logical fallacy. Error lies principally in defective premises. Sophistry in science is referable to incomplete analysis of nature, of systems—to artificial arrangements—to *supposing* qualities, to *assuming* principles, to false inductions from imperfect demonstration.

Dickens, in 'Nicholas Nickleby,' gives the case of a certain lady, who, because she knew *one* young milliner, who retained red cheeks and did not die of consumption, was immovably of opinion that all representations of the injurious effect of such sedentary occupation were false. It is ever so with the vulgar. Some one case has come under their notice, and it is in vain that you appeal to a chain of facts. They know nothing of induction—they know one case to the contrary, and that is enough. This error is the source of vulgar prejudice. Once teach men that truth does not lie in a single instance, but in a calculation in a balance of probabilities, and you rationalise them. 'The chapter of accidents [or single instances] is the Bible of the fool—it supplies him with a text against everything great, or good, or wise.'*

> Where others toil with philosophic force,
> Their nimble nonsense takes a shorter course,
> Flings at your head convictions in the lump,
> And gains remote conclusions with a jump.—*Cowper.*

The first source of error is defective induction. We easil arrive at this point of examination by the questions we have proposed for use in the test of syllogism. Formerly, one syllogism was required to be defeated by another—we now attack a fallacy by induction. No false syllogism, says Brennan, can resist the inductive process of sifting particulars.

> I do not like thee, Dr. Fell,
> The reason why, I cannot tell—
> But this I know, and know full well,
> I do not like thee, Dr. Fell.

This kind of thing will not do. Induction pursues the reasoner

* Times.

with an eternal *why*. A clear because to a clear why, is a demand that is never remitted in sound logic.

Lord Melbourne, in giving his reason for his religion in the House of Lords, said it was the religion of his forefathers and that of his country, *therefore*, he would support the church. (Cheers from the opposition benches.) The Brahmin and Mussulman give the same reason for theirs. A logician in facts would have said, I hold and support my religion because it is *true*. What the standard of physical certainty is to facts, what axioms are to science, such is induction to syllogisms—it is the test of their correctness.

Dr. Whately exhibits the following instance of a regularly expressed syllogism:—

> Every dispensation of Providence is beneficial:
> Afflictions are dispensations of Providence,
> Therefore, they are beneficial.

Every applicable rule of Dr. Whately's logic is, of course, applied here—it is true in mood and figure, and yet the argument is fallacious. A fallacy is defined as 'an ingenious mixture of truth and falsehood, so entangled as to be intimately blended—that the falsehood is, in chemical phrase, *held in solution*: one drop of sound logic is that test which immediately disunites them, makes the foreign substance visible, and precipitates it to the bottom.'* But whence is to come 'this drop of sound logic?' Not from the Doctor's '*Elements*,' they have sent forth the fallacy. But touch it with the talisman of facts and the error will appear.

What facts support the assertion that 'Afflictions are dispensations of Providence?' The simple question is fatal to the argument. Can such a proposition have facts for its support? Ignorance, congregating in narrow courts, and laziness, accumulating filth, generate sickness and affliction. Are these the dispensations of Providence, or the dispensations of folly and crime? To ascribe them to Providence is virtually to allow ignorance and laziness to step into the throne of God, and call upon men to believe in *their* beneficent dispensations.

Dr. Watts, another writer on logic, set the Christian congregations of England to sing the same species of fallacy:—

* Whately's Logic, Anal. Out., chap. 1, sec. 4.

Diseases are thy servants, Lord,
They come at thy command;
I'll not attempt a murm'ring word,
Against thy chast'ning hand.

According to this lyrical logician, whenever wise precautions arrest the progress of pestilence, or the physician's skill subdues disease, Jehovah is robbed of a servant. By such an argument, humanity is made to be in rebellion against heaven, and our medical colleges are in antagonism with Deity, and the recent appointment, by the Russell government, of a Sanatory Commission, was high blasphemy. It is the degradation of language to employ it to such a purpose, and logic needs revising to save us from publishing such puerility in the name of learning and of reason. It must have been logic of this kind that induced a strong-thoughted woman to hazard the bold but tenable conjecture, that 'If an argument has truth in it, less than a philosopher will see it—and if it has not, less than a logician will refute it.'*

R. G. Latham, M.D., in his 'First Outlines of Logic applied to Grammar and Etymology,' has introduced the particular instance of the syllogism on Providence here cited from Whately. It would be no difficult task to present other instances of the same species of polemical fallacy from Dr. Whately and other writers on logic, did it comport with the rule I have chosen for observance. I give these cases chiefly to show how extensively and obstrusively they are introduced.

'We have,' says Mr. Mill, 'five distinguishable classes of fallacy, which may be expressed in the following synoptic table:—

Fallacies	of Simple Inspection			1. *a priori*.
	of Inference	from evidence distinctly conceived	Inductive Fallacies	2. Observation.
				3. Generalisation.
			Deductive Fallacies	4. Ratiocination.
		from evidence indistinctly conceived		5. Confusion.'

It was the boast of Archimedes, that if any one would find him a fulcrum, on which to rest a prop, he would raise the world. But this was mere assertion unsupported by facts, for if the fulcrum had been found him, Archimedes could not have performed

* A Few Days in Athens, by Frances Wright.

his promise. This has been proved by Ferguson, who has demonstrated that if Archimedes could have moved with the swiftness of a cannon ball—480 miles every hour—it would have taken him just 44,963,540,000,000 of years to have raised the world *one inch*. Bulwer remarks, 'Critics have said, what a fine idea of Archimedes! But how much finer is the *fact* that refutes it. *One of the sublimest things in the world is plain truth.*'

All motion generates warmth,
Shaking (with cold) is motion,
Ergo, shaking with cold generates warmth.

We look, in this case, to the facts on which the first proposition rests, and find the assertion too general.

To one who said that none were happy who were not above opinion, a Spartan replied, 'Then none are happy but knaves and robbers.'

Mr. Goodrich, the original 'Peter Parley,' gives, in his 'Fireside Education,' an instance to this effect of two boys arguing on the division of their beds. William exclaims, 'You take more than your share of the bed, James.' James answers, 'I only take half the bed.' William replies, 'True, but you take your half out of the middle, and I am obliged to lie on *both sides* to get my half.'

Innumerable sophisms are suffered to pass in consequence of some brilliancy of position which dazzles us and prevents our seeing that they are wide of the mark of reason. An instance occurs in Bulwer—who says, 'Helvetius erred upon education—but his dogma has been beneficial.' Probably so—but not so beneficial as the truth would have been. Many persons have argued from such an instance, that error is useful. Dickens, in those incidental observations of striking good sense strewed up and down his writings, says, in the 'Cricket on the Hearth;'—'These remarks (of Mrs. Fielding) were quite unanswerable; which is the happy property of all remarks that are *sufficiently wide of the purpose*.' Of the refutation of such remarks he has presented an able instance in 'Martin Chuzzlewit:'—

'Bless my soul, Westlock,' says Pinch, 'is it nothing to see Pecksniff moved to that extent and know one's self to be the cause? And did you not hear him say that he could have shed his blood for me?'

'Do you *want* any blood shed for you?' returned Westlock with

considerable irritation. 'Does he shed anything for you that you *do* want? Does he shed employment for you, instruction for you pocket money for you? Does he even shed legs of mutton for you in any decent proportion to potatoes and garden stuff?'

CHAP. XII.

SCEPTICISM.

Man has been called the plaything of chance, but there is no logic more close and inflexible than that of human life: all is entwined together; and for him who is able to disentangle the premises and patiently await the conclusion. it is the most correct of syllogisms.—JULES SANDEAU: *People's Journal*, No. 87.

'To quote authors,' says Harris, in his preface to his 'Hermes,' 'who have lived in various ages, and in distant countries; some in the full maturity of Grecian and Roman literature; some in its declension; and others in periods still more barbarous and depraved; may afford, perhaps, no unpleasing speculation, to see how the SAME REASON has at all times prevailed; how there is ONE TRUTH like one sun, that has enlightened human intelligence through every age, and saved it from the darkness both of sophistry and error.' This is the assurance which right reason will ever impart. Underneath all the change after which we pant, amid all the variety which surrounds us, and seems the very aliment of our nature, lies the instinct after the permanent. It is the province of sound logic to guarantee this in conclusion.

The novelty, change, fluctuation, which scientific discovery has brought, and will yet bring, into the formerly settled worlds of opinion and social condition, will unsettle men's minds, and pave the way to an age of scepticism. Sound logic is necessary to provide that this doubt is transitional and not ultimate.

Scepticism is of two kinds, that of Pyrrho, and that of examination. The followers of Pyrrho, it is said, made doubting a profession, until at last they doubted whether they did doubt. This is the scepticism of the scorner and trifler.

He did not know that he did not know it, and if he did know it it was more than he knew. This is as far as the philosopher, of this school can go. Dickens has drawn the portrait of these logicians in Mr. Tigg:—

'When a man like Slyme,' said Mr. Tigg, 'is detained for such a thing as a bill, I reject the superstition of ages, and believe nothing. I don't even believe that I *don't* believe, curse me if I do.'

Hood is ironical on the professors of uncertainty. 'On a certain day of a certain year, certain officers went, on certain information, to a certain court, in a certain city, to take up a certain Italian for a certain crime. What gross fools are they who say there is nothing certain in this world.'

But scepticism is not capable of disturbing the well-grounded repose of the wise; for when the sceptic thinks he has involved everything in doubt, everything is still left in as much certainty as his scepticism.

In the great maze of conflicting opinion, it matters little that we are cautioned that reason is not all-sufficient—it is the best sufficiency we have. If reason will not serve us well, will anything serve us better? Bishop Berkeley may demonstrate that we are not sure of matter's existence—but are we more sure of any thing else? We are not thus to be cajoled. But it is right to say that Mr. J. S. Mill contends that Berkeley has been misunderstood—but if he did argue, as popularly believed, to such argument, the answer of Byron is sufficient—

> When Berkeley said there was no matter,
> It was no matter what he said.

If all is delusion, the delusion is very orderly—it observes regular laws, and we proceed in logical method to inform each other, how the delusion of things appears to our understandings or affects our fortunes.

> Where nothing is, and all things seem,
> And we the shadows of a dream,

we discuss the seemings with the same gravity as realities. If a man seems to do wrong, and I seem to prevent him, and the wrong, therefore, seems not to be done, I am satisfied.

The 'wise considerate scepticism' of inquiry has been well expressed by Emerson, in his recent lecture on Montaigne. —'Who shall forbid a wise scepticism, seeing that there is no practical question on which anything more than a proximate solution is to be had? Marriage itself is an open question: those "out" wish to be "in;" those "in" to be "out."

The state, with all its obvious advantages, nobody loves it. Is it otherwise with the Church? Shall the young man enter trade or a profession, without being vitiated? Shall he stay on shore or put out to sea? There is much to be said on both sides. Then there is competition, and the attractions of the co-operative system. The labourer has a poor hut, is without knowledge, virtue, civilisation. If we say, "Let us have culture," the expression awakens a new indisposition; for culture destroys spontaneous and hearty unencumbered action. Let us have a robust, manly life; let us have to do with realities, not with shadowy ghosts. Now this precisely is the right ground of the sceptic; not of unbelief, denying or doubting—least of all of scoffing and profligate jeering at what is stable and good. He is *the considerer*. He has too many enemies around him to wish to be his own. The position of the sceptic is one taken up for defence; as we build a house not too high or too low, under the wind, but out of the dust. For him the Spartan vigour is too austere. St. John too thin and aerial. The wise sceptic avoids to be fooled by any extreme;—he wishes to see the game. He wishes to see all things, but mainly men. Really our life in this world is not of so easy interpretation as preachers and school-books are accustomed to describe it. These have not so efficiently solved the problem, that the sceptic should yield himself contentedly to their interpretation. True, he does not wish to speak harshly of what is best in us,—to turn himself into a "devil's attorney." But he points out the room there is for doubt;—the power of moods;—the power of complexion, and so forth. Shall we, then, because good-nature inclines us to virtue's side, smoothly cry: "There are no doubts!"—and lie for the right? We ask whether life is to be led in a brave or a cowardly way: whether the satisfaction of our doubts be not essential to all manliness: whether the name of virtue is to be a barrier to that which is virtue? The sceptic wants truth, wants to have things made plain to him, and has a right to be convinced in his own way. In such scepticism there is no malignity; it is honest, and does not hinder his being convinced; and this hard-headed man, once convinced, will prove a giant in defence of his faith. The true and final answer in which all scepticism is lost is the moral sentiment; that never forfeits the supremacy. It is the drop that bal
the universe.'

Science and logic have so far advanced as to abridge the field of doubtful questions. When syllogism answered syllogism, uncertainty reigned absolute—but now that the appeal is to facts, we can, wherever facts can be had, weigh or number them, and decide on one side or the other.

When Ali Pacha was at Janina, the case of a poor woman, who accused a man of the theft of all her property, was brought before him; but the plaintiff having no witnesses, the case was discharged, as the other asserted his innocence, and insisted as a proof, that he had not a farthing in the world. On their leaving his presence, Ali ordered both to be weighed, and then released them without further notice. A fortnight afterwards, he commanded both into his presence, and again weighed them; the accuser had lost as much as the defendant had gained in weight. The thing spoke for itself, and Ali decided that the accusation was just. Ali Pacha was the Burlamiqui of justice. Induction, too, has its scales, and seldom leaves us in doubt when it gets truth and falsehood in them. Scepticism is now happily restricted to those questions resting on conjectures, and which do not pertain to the practical affairs of this life. On matter-of-fact questions, only the weak are perplexed. After men have been in deliberation till the time of action approach, if it be not then manifest what is best to be done, it is a sign the difference of motives the one way and the other is not great; therefore, not to resolve then is to lose the occasion by weighing of trifles, which is pusillanimity.

Quaint old Bunyan tells us, that when he had completed his 'Pilgrim's Progress' he took the opinions of various friends on the propriety of publishing it. Some said 'John, do;' others 'John, don't.' But solid old John was not to be thus confounded. 'Then I will print it,' said he, 'and thus the case decide.' To this good sense the public owe that immortal dream.

In the great field of physical investigation, science has conquered doubt. 'Contingency and versimilitude are the offspring of human ignorance, and, with an intellect of the highest order, cannot be supposed to have any existence.'*

'Probability,' says Laplace, 'has reference partly to our ignorance, and partly to our knowledge.'

'Chance,' observes Mr. Mill, 'is usually spoken of in direct antithesis to *law*; whatever (it is supposed) cannot be ascribed

* Edinburgh Review, September 1814, article Probabilities.

to law, is attributed to chance. It is, however, certain, that whatever happens is the result of some law; is an effect of causes, and could have been predicted from a knowledge of the existence of those causes, and from their laws. If I turn up a particular card, that is a consequence of its place in the pack. Its place in the pack was a consequence of the manner in which the cards were shuffled, or of the order in which they were played in the last game; which, again, were the effects of prior causes. At every stage, if we had possessed an accurate knowledge of the causes in existence, it would have been abstractedly possible to foretel the effect.'*

'In the domain of morals, too, a certainty, not dreamed of in past times, now prevails. However much man, as an individual, may be an enigma, in the aggregate he is a mathematical problem.'†

In the great world of opinion it is the duty of honest reasoners to endeavour to find out the truth, and take sides, undeterred by the philosophical frivolity now growing fashionable. If men are silent concerning objects and principles, it is said they have none, and it is impatiently asked 'where is their bond of union?' And no sooner is it explained than they are told 'it is very unphilosophical to think of setting up a creed.' Where the alternatives are thus put against them they should take their own course. Creeds are the necessary exponents of conviction. The creedless philosopher is out on the sea of opinion, without compass or chart. To bind yourself for the future to present opinions is doubtless unwise, but he who has inquired to any purpose has come to some conclusion, affirmative, negative, or neutral; and it is the province of a creed to avow the actual result, and the consequent conduct intended to be followed. It is the vice of free thinking that it spreads universal uncertainty, and assumes right and wrong to be so protean that no man can tell one hour what opinion he shall hold the next. Logic should correct this unsatisfactory extreme, and extirpate the tiresome race whom Shelley described in Peter Bell:—

> To Peter's view, all seems one hue;
> He is no Whig, he is no Tory;
> No Deist and no Christian he—
> But is so subtle, that to be
> *Nothing* is all his glory.

* Logic, pp. 57-8, vol. 2.
† Vestiges.

CHAP. XIII.

INTELLECTUAL DARING.

Freedom has been hunted through the world, and is ever exposed to insult and injury. It is crushed by conquest; frowned from courts; expelled from colleges; scorned out of society; flogged in schools; and anathematised in churches. Mind is her last asylum; and if freedom quail there, what becomes of the hope of the world, or the worth of human nature?—W. J. Fox's Lectures to the Working Classes, part 12, p. 65.

We should be prepared to dare all things for truth. If the 'very hopes of man, the thoughts of his heart, the religion of nations, the manners and morals of mankind, are all at the mercy of a new generalisation,' we should be prepared to risk them. If we must choose between truth and repose, we ought not to hesitate. There is danger in having the truth—philosophers are obliged to conceal it. Mankind vaunt their love of truth, but they are not to be trusted. From interest or ignorance they always persecute, and often kill, the discoverer. Still the pursuit of truth is a *duty*, and we must find consolation in the heroic reflection of Burke, that *in all exertions of duty there is something to be hazarded.* But intellectual daring will never be common while it is so generally believed to be criminal. We will, therefore, quote some considerations touching the rightfulness of inquiry.

Without INQUIRY it is impossible for us to KNOW whether our opinions are true or false, and various are the pretences employed for declining investigation: frequently they are masked under vague and metaphorical phrases: "inquiry implies the weighing of evidence, and might lead to doubt and perplexity"—"to search into a subject might shake the settled convictions of the understanding"—to examine opposite arguments, and contradictory opinions, might contaminate the mind with false views.

'Every one who alleges pretexts like these for declining *inquiry*, must obviously begin by assuming that his own opinions are unerringly in the right. Nothing could justify a man for declining the investigation of a subject involving important opinions, but the possession of an understanding *free* from liability of error. Not gifted with infallibility, in what way, except by diligent inquiry, can he obtain any assurance that he is not pursuing a course of injurious action? If he holds any opinion, he must have acquired it either by examination, by instillation, rote, or

some other process. On the supposition that he has acquired it by proper examination, the duty on which I am now insisting has been discharged, and the matter is at an end—but if he has acquired it in any *other* manner, the mere plea, that his mind might become unsettled, can be no argument against the duty of investigation. For anything he can allege to the contrary, his present opinions are wrong—and, in that case, the disturbance of his blind convictions, instead of being an evil, is an essential step towards arriving at the truth.

'It may possibly be assigned, as a further reason for his declining inquiry, that he may come to some fallacy which he cannot surmount, although convinced of its character. If he is convinced of its character, he must either have grounds for that conviction or not. If he has grounds, let him examine them, draw them out, try if they are valid, and then the fallacy will stand exposed. If he has no grounds for suspecting a fallacy, what an irrational conclusion he confesses himself to have arrived at! But perhaps he will reply—he may be unable to solve the difficulty; his mind may become perplexed, and the issue may prove, after all, that it would have been much better had he remained in his former strong, though unenlightened, conviction. Why better? If he is in peplexity let him read, think, consult the learned and the wise, and in the end he will probably reach a definite opinion on one side or the other. But if he should still remain in doubt, where is the harm? or rather, why is it not to be considered a good? The subject is evidently one which admits strong probabilities on opposite sides. Doubt is therefore the *proper* sentiment for the occasion—it is the result of the best exercise of the faculties—and either positively to believe, or positively to disbelieve, would imply an erroneous appreciation of evidence.

'In the minds of some people a strong prejudice appears to exist against that state of the understanding which is termed doubt. A little reflection, however, will convince any one that on certain subjects "*doubt*" is as appropriate a state of the reasoning faculties as belief or disbelief on others. There are doctrines, propositions, facts, supported and opposed by every degree of evidence, and amongst them by that degree of evidence of which the proper effect is to leave the understanding in an equipoise between two conclusions. In these cases "*doubt*" is the

appropriate result, which there can be no reason to shrink from or lament. But it may be further urged, that inquiry might contaminate the understanding with false views—and, therefore, it is wise and laudable to abstain from it.

'We can comprehend what is meant by contaminating a man's habits or disposition, or even imagination. But there is no analogy on these points in reference to the understanding. There is contamination, there is evil, in preposterous and obscene images crowding before the intellectual vision, notwithstanding a full and distinct perception of their character—but there is no contamination, no evil, in a thousand false arguments coming before the understanding, if their quality is clearly discerned. The only possible evil in this case is mistaking false for true—but the man who shrinks from investigation lest he should mistake false for true, can have no reason for supposing himself free from that delusion in his actual opinions. Besides these objections to INQUIRY, there are other prejudices of a similar character, forming serious impediments to the attainment of truth.

'One of these is *a fear that we may search too far, and become chargeable with presumption in prying into things we ought not to know.* A few words will suffice to prove that nothing can be more irrational and absurd. We have already shown that *true* opinions are conducive to the welfare of mankind—and the prosecution of *inquiry* is therefore a process from which we have everything to hope and nothing to fear, and to which there are no limits but such as the nature of our own faculties prescribes.

'A second prejudice—that *we may contract guilt, if, in the course of our researches, we miss the right conclusion, and had therefore better let inquiry alone*—is still more influential in preventing those investigations which it is our duty to make. As our opinions on any subject are not *voluntary* acts, but *involuntary* effects, in whatever conclusions our researches terminate they can involve us in no culpability. All that we have to take care of is, to bestow on every subject an adequate and impartial attention. Having done this, we have discharged our duty; and it would be irrational and unmanly to entertain any apprehension for the result.

'In fact, there is the grossest inconsistency in the prejudice now under consideration. If we may contract guilt by searching after

truth, we may equally do so by remaining in our present state The reason alleged in the prejudice itself, and the only reason which can be assigned with any plausibility, why we may commit an offence by embarking in any inquiry, is that we may, by so doing, miss the right conclusion, or, in other words, fall into error —for no one would seriously contend that we incur any moral culpability by an investigation which conducts us to the truth. But it is obvious that we may equally miss the right conclusion by remaining in our actual opinions. It is, then, incumbent on us to ascertain whether we are committing an offence by remaining in them—in other words, it is necessary to *examine* whether those opinions are true. Thus the reasons assigned for *not* inquiring, lead to the conclusion that it is *necessary* to inquire.

'The third prejudice is that acquiescence in received opinions, or forbearing to think for ourselves, shows a degree of humility highly proper and commendable—if closely examined will be found usually to evince nothing but a great degree of indolent presumption, or intellectual cowardice. There is often, in truth, as great a measure of presumption in this species of acquiescence as in the boldest hypothesis which human invention can start. That received and established opinions are true, is one of those sweeping conclusions which would require very strong reasons, and often elaborate research, to justify. On what grounds are they considered to be true by one who declines investigation? Because (on the most favourable supposition) they have been handed down to us by our predecessors, and have been held with unhesitating faith by a multitude of illustrious men. But what comprehensive reasons are these? What investigation would it require to shew that they were valid? As the whole history of mankind teems with instances of the transmission of the grossest errors from one generation to another, and of their having been countenanced by the concurrence of the most eminent of our race —how, without examination, can we show that *this* particular instance is an exception from the general lot?

'From the necessity of using our own judgment, or, in other words, of arriving at a conclusion for ourselves, we cannot be absolved. Far from being a virtue, blind acquiescence in the opinions of others is, in most cases, a positive vice, tending to stop all advancement in knowledge, and all improvement in practice.

From the preceding it is evident that the inquirer may enter on his task with full confidence that he is embarking in no criminal, or forbidden, or presumptuous enterprise, but is, on the contrary, engaging in the discharge of a duty. Let him be as circumspect as he pleases in collecting his facts and deducing his conclusions, cautious in the process, but *fearless* in the result. Let him be fully aware of his liability to error, of the thousand sources of illusions, of the limited powers of the individual, of the paramount importance of truth—but let him dismiss *all apprehensions* of the issue of an investigation conducted with due application of mind and rectitude of purpose.'*

Marcus Antoninus, indeed, said 'I seek after truth, by which no man yet was ever injured.' But there is a great practical mistake here. There *is* danger in truth—and the admission should be plainly made. Men, where forewarned, make the choice more manfully. We have been wisely told by Emerson, that the cherished thoughts and institutions of mankind are at the mercy of a new generalisation—rest, commodity, reputation. Inconvenience, and suspense, are the consequences of the partizanship of truth. Certain political truths annihilate the interests of whole classes. Certain social truths war with life-cherished prejudices. Certain sanitary truths reduce the value of all city property. Certain scientific truths ruin the working classes by thousands. In a wiser state of society this could be prevented, but our present business is with what *is*. It is therefore idle to conceal the truth—that there is danger in truth. Pope's dictum, that party is the madness of many for the gain of a few, is inversely true of truth. Truth is the ultimate benefit of many, but the immediate ruin of the few. Here, however, comes to our aid the wise and far-seeing aphorism of Burke—'In all exertions of duty there is something to be hazarded'—and the brave man and wise friend of mankind will risk the fate which surely awaits him—the fate of Galileo, Newton, Salomon de Caus, Volta, Fulton, Winser, Arkwright, Gall, and all who present themselves, with truth in their hands, at the door of this great bedlam called the world—the fate of being received with stones and hisses.

* Extracts of Summary, by Aliquis, of arguments on the *Duty* of Inquiry, from the 'Pursuit of Truth, and other Essays,' by S. Bailey, in *Reasoner* No. 12.

CHAP. XIV.

IDOLS.

The term Idol is employed by Bacon to designate those prejudices which men prefer to truth. A prejudice is a bias without a reason for it, an opinion without a foundation, a judgment formed of persons and things without sufficient examination, an assent given to a proposition without sufficient evidence. The bias may be honourable, the opinion correct, the assent in the right direction, but still of the nature of prejudice, because, if right, it is right by accident rather than design.

Ignorance hides from us facts, and we decide partially rather than confess our deficiency. Ill-directed education gives us prepossessions, which are obstacles in the way of truth, and we continue to cherish what, having become a part of our nature, it pains us to discard. The senses will occasionally mislead us and although we are conscious that appearances are not to be wholly trusted, we reluctantly doubt our own infallibility. From early, and therefore unquestioned, associations, we have acquired certain habits, and from fashion certain sentiments, and we continue old customs, and fall into the current opinion unconsciously. Of these sources of prejudice, logic warns us to beware. Of so much importance did Bacon regard these hindrances to truth, that he considered the pursuit of new truth hopeless while they were cherished. In a mixed vein of poetry and philosophy, he divided prejudices into four classes, which he called Idols of the Tribe, the Den, the Market and the Theatre. Idols of the Tribe are prejudices men imbibe from early training, and love of hypothesis. They are so called because common to the whole race or tribe of mankind. Idols of the Den are those which relate to a man's particular character. Idols of the Market are those which are accommodated to common notions. Idols of the Theatre denote such as pertain to hypothetical systems of philosophy.

Remembering the declarations of Euler and Gall, and the daily discoveries of science, we should stand, as it were, on the verge of the old world of experience, and look out on the new world of truth. A young thinker should make for himself a chart of proposed reforms, systems, and changes, agitated in his day—place

in relative positions in the scale of importance such as he deems of value, if true—and then analyse his experience to see what is soundly opposed thereto. Such a practice would go far to rid men of idol-prejudices, which retard private improvement and public progress.

CHAP. XV.

ILLUSTRATIVE EXERCISES.

1. ALL men possessed of an uncontrolled discretionary power, leading to the aggrandisement and profit of their own body, have always abused it.'—*Burke's Thoughts on the Present Discontents.*

The student will find the proof of this proposition exhibited in the example of Induction, quoted from Mr. Bailey, p. 63.

2. Prosperity could never be reached and maintained in this country, without some provision for the *regular employment* of the poor.—*Mr. Beckett's Speech in the House of Commons*, Feb. 3, 1842.

The demonstration, to universal conviction, of this proposition, would lead to an entire and beneficial change of the social condition of this country.

3. The pen is the tongue of the world.—*Paine.* Put this in the syllogistic form.

4. A good instance of a metaphorical argument drawn out is given by Mr. Mill:—'For instance, when Mr. Carlyle, rebuking the Byronic vein, says that "strength does not manifest itself in spasms, but in stout bearing of burdens;" the metaphor proves nothing, it is no argument, only an allusion to an argument; in no other way however could so much of argument be so completely suggested in so few words. The expression suggests a whole train of reasoning, which it would take many sentences to write out at length. As thus: Motions which are violent but brief, which lead to no end, and are not under the control of the will, are, in the physical body, more incident to a weak than to a strong constitution. If this be owing to a cause which equally operates in what relates to the mind, the same conclusion will hold there likewise. But such is really the fact. For the body's

liability to these sudden and uncontrollable motions arises from irritability, that is, unusual susceptibility of being moved out of its ordinary course by transient influences: which may equally be said of the mind. And this susceptibility, whether of mind or body, must arise from a weakness of the forces which maintain and carry on the ordinary action of the system. All this is conveyed in one short sentence. And since the causes are alike in the body and in the mind, the analogy is a just one, and the maxim holds of the one as much as of the other.'*

5. A youth, named Evathlus, engaged with Protagoras to learn dialectics, and promised his tutor a large sum of money, *in case he gained the first cause he pleaded.* Evathlus, when fully instructed, refused to pay his instructor. Protagoras brought his action thus—'You must pay the money however the cause go, for if I gain you must pay in consequence of the sentence, as being cast in the cause; and if *you* gain it, you must pay in pursuance of our covenant.' 'Nay,' Evathlus retorts, 'which way soever the cause be decided, you will have nothing, for if I prevail, the sentence gives it that nothing is due: and if I lose, then there is nothing due by the covenant.' What should be the decision in this case?

6. The first case, says Cervantes, requiring Sancho's attention was a question put by a stranger, in presence of the stewards and rest of the attendants. 'My Lord,' said he, 'a certain manor is divided by a large river. I beg your honour will be attentive, for the case is of great consequence and of some difficulty. I say then, upon this river is a bridge, and at one end of it the gibbet, together with a sort of court hall, in which four judges usually sit to execute the law enacted by the lord of the river, bridge, and manor, which runs to this effect: Whoever shall pass this bridge, must first swear whence he comes and whither he goes; if he swear the truth he shall be allowed to pass, but if he forswear himself he shall die upon the gallows without mercy or respite. This law, together with the rigorous penalty, being known, numbers passed, and as it appeared they swore nothing but the truth, the judges permitted them to pass freely and without control. It happened, however, that one man's oath being taken, he affirmed and swore by his deposition that he was going to be hanged on that gibbet, and had no other errand or intention. The

* Logic, pp. 433-4, vol. 2.

judges, having considered this oath, observed: if we allow this man to pass freely, he swore to a lie, and, therefore, ought to be hanged according to law; and if we ordered him to be hanged after he hath sworn he was going to be suspended on that gibbet, he will have sworn the truth, and by the same law he ought to be acquitted. I beg, therefore, to know, my lord governor [and student], what the judges must do with this man?'

CHAP. XVI.

TECHNICAL TERMS.

ABSTRACT NAMES—the names of attributes.—*J. S. Mill.*

ABSTRACTION—fixing thought on the point of resemblance in one body.

— drawing off and contemplating separately any part of an an object.

ACTION—a volition followed by an effect.—*J. S. Mill.*

ANALOGY—resemblance of relation.—*Whately.*

ANALYSIS—the resolution of a complex whole into its component elements.—*J. S. Mill.*

ARGUMENT—an expression in which, from something laid down as granted, something else is deduced.—*Whately.*

ARGUMENTUM AD HOMINEM—appealing to an opponent's professed views.

A PRIORI—reasoning from cause to effect.

A POSTERIORI—arguing from effects to cause.

BODY—the unknown cause of our sensations—*J. S. Mill.*

CAUSE—the invariable antecedent, or thing going before.

— the stimulus of an effect.

CONCLUSION—a proposition proved by argument.

CONNOTATIVE TERMS—denote a subject, and imply an attribute.—*J. S. Mill.*

CONSCIOUSNESS—sensation of existences.

DEFINITION—the separation of a thing, as by a boundary, from everything else.

DISCOVERY—finding out something already existing.

EFFECT—the immediate, invariable consequent, or the change produced by power.

ENTHYMEME—An argument with one premiss suppressed being understood.

EXPERIENCE—events which have taken place within a person's own knowledge.—*Whately.*

FALLACY—an apparent argument.

GENERAL TERMS—express the notion of partial similarity.

GENERALISATION—tracing certain points of resemblance.

— naming one respect in which many things agree.

INDUCTION—universalisation of truth by inference from uniform facts.

INTUITION—imaginary looking.—*Whewell.*

LOGIC—a scientific use of facts.

LOGICAL TRUTH—that which admits of proof.—*Chambers.*

MIND—the unknown percipient of sensation.—*J. S. Mill.*

NECESSARY TRUTHS—are those in which we not only learn that the proposition *is* true, but see that it *must be* true; in which the negative of the truth is not only false, but impossible; in which we cannot, even by an effort of the imagination, or in a supposition, conceive the reverse of that which is asserted.—*Dr. Whewell:* Phil. Inductive Sciences, pp. 54-5, vol. 1.*

NON-CONNOTATIVE TERMS—denote a subject only and an attribute only.—*J. S. Mill.*

PHILOSOPHY—the science of *realities* in opposition to that of mere appearances—the attempt to comprehend things as they *are*, rather than as they *seem*.—*Morell.*

POINT AT ISSUE—the real question to be decided.

POWER—in logic, is the relation of circumstances to each other in time.

PREMISES the propositions which precede a "conclusion."

— the name of the propositions from which a conclusion is deduced.

* As 'necessary truths' are much talked of, I have introduced here, from Whewell, the completest definition with which I am acquainted. For myself, I coincide on this question with J. S. Mill, as quoted pp. 22-3.

PRINCIPLE—an *invariable* rule.

PROOF—sufficient evidence; the balance of probability in favour of a proposition.

PROPOSITION—a sentence which affirms or denies something.—*Whately.*

— An expression in words of a judgment.—*J. S. Mill.*

REASON—the recognition of facts.

— the classification of facts.

— following in the pathway of facts.

— the power of discerning coherences.

— a premiss placed after its conclusion.

— the minor premiss—in the sense of Reason for asserting something.

REASONING—argumentation.

— process, the same always.

SUBJECT—first term of a proposition.

SYLLOGISM—1. A general rule. 2. A fact contained under that rule. 3. A conclusion that the fact is so contained.

— an argument stated regularly and at full length.

— a valid argument so stated that its conclusiveness is evident from the mere *form* of the expression.

TECHNICAL TERMS—the tools of art.—*Whately.*

TECHNICAL LANGUAGE—regularly formed, defined, and agreed on set of expressions.

TESTIMONY—second-hand experience. *Direct* evidence is that which is professedly given. *Incidental*, is corroboration casually introduced on one subject in the course of an evidence delivered on another.

THEORY—is a system of rules intended to explain a class of facts. The rules should be precise, and rest on a rigorous induction of facts or probabilities.

TRADITION—the relation of a circumstance, not committed to writing by any person who observed it, but communicated orally from one to another for a long period of time.